PERSONAL COMPUTING

Breaking Away Money Saisted Communications Property Speed to Sour Ministers Property Read Color Baller's Chinic Property Read Color Baller's Color Baller's Chinic Property Read Color Baller's Color Baller's Chinic Property Read Color Baller's David Dempsey, a Prudential-Bache vice-president, takes a break from making multimillion dollar deals by delving into a flight simulator.



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(For More Information Circle 3)

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PERSONAL COMPUTING



Sales Force

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PERFORMANCE

Saving Money With Speedier Communications62

Sending data over phone lines at 300 bits per second is a slow process. As the amount of information begins to mount, the process can also prove rather costly. That's why speed is the name of the communications game today. Even data transmission at 1200 bps is rapidly being eclipsed by modems that send and receive at 2400, 9600, 18,000 bps or even higher. While the waiting time can be cut down considerably, the real savings arrives in the form of dramatically lowered phone bills. In high-volume situations, you may also want to consider installing a leased telephone line to handle the load.

PRODUCTIVITY

Write Faster 71

Exploiting underutilized features in a word processor or using an add-on program can significantly reduce the number of keystrokes it takes to get the job done. Boilerplating paragraphs or frequently used sentences, searching and replacing abbreviations with longer phrases and exploiting your word processor's mailmerge functions are some of the ways to work faster. Memory-resident add-on programs can also help you save strokes. Here are speedier ways to get the word out.

CORPORATE/BUSINESS

Making Your Sales Force More Productive81

Companies which realize that computers are more than administrative tools can benefit big by using them in marketing applications. Yet, helping your staff see computing prowess as a way to increase orders may be your hardest job as a sales manager. Nevertheless, you won't have to do it again, once the results are in.

LEISURE

Breaking Away90

Some high-level business executives relieve the pressure of the board-room by immersing themselves in computer simulations—detailed recreations of real-life situations. While some execs use simulations strictly to relax, others use them to hone skills that they can take back to their jobs.

BUYERS GUIDE

EGA Boards And Monitors115

You no longer have to choose between sharp text in monochrome or fuzzy text in color. With an enhanced graphics adapter plug-in board and an EGA monitor, text and graphics can now be displayed in high-resolution color.

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NewWord 3, Graph-In-The-Box, Proprinter XL, Data General DG/One Model 2, It Figures, Sakata's EGA Performer and Tatung's CM-1380 monitors, Webster's New World On-Line Thesaurus, The Bernoulli Box 20 + 20 (Model 220), Map Master, The DEST PC Scan and Microlink 2400 Modem from U.S. Robotics.

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Checking for IBM PC compatibility; a shortcut for jumping into hard disk sub-directories.

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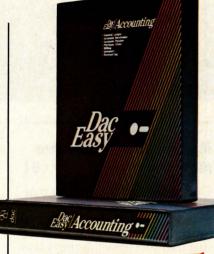
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(For More Information Circle 9)

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EDITOR'S NOTE

Simulations For Executives

ome people think of them as games. Some think of them as tools to help hone business skills. What's being thought about are simulations, the subject of this month's cover story.

We decided to take a look at simulation programs, many of them new, because they are providing business people with an escape from the intensity of work, and we think everyone can use a breather sometime.

We found that, just as intensely as many of you work, you intensely seek an escape, to totally divert your attention to something else. And for some, the ultimate diversion or escape is to use simulations to assume another role.

The role might be as a bank president or an entrepreneur, a pilot or a submarine commander. But no matter what the role, the users take the simulations very seriously.

Author Denise Caruso, who spoke with more than 20 users of simulations, found that many of them like simulations because these programs model the real world, and who doesn't need a bit more practice at succeeding in the real world?

No matter what the reason, we hope that the viewpoint we provide from business people who use simulations will help you decide if they are for you.

Another issue we try to help you with this month is how to make your sales force more productive. As you can imagine, this goes beyond merely giving salespeople personal computers and telling them to enter orders from the field.

There are ways to better organize the week, to prepare for presentations, to get the edge on competitors. As usual with computing and the state of technology, it will take time and patience to implement new computerized applications, but the payback should be substantial.

We're always looking for ways to help you do your work better or faster. In Senior Editor Chris O'Malley's feature story "Write Faster," experts share their personal tips on getting letters, reports or memos out faster. You should be able to take some of the information in this story and use it to speed up your writing.

We hope many of our monthly feature stories provide quick results for you. These stories offer common-sense tips from a variety of sources; tips that some of you may have been too busy to think of yourselves.

Back in January, we ran an essay entitled "Why Not Make Computing Easier?" and your response was overwhelming. We didn't expect to hit such a nerve. Unfortunately, you, the users, have to suffer while waiting for the personal computer industry to relate to your immediate needs.

It's now six months later, and we are interested in whether you think anything has changed. Has computing gotten any easier? If not, does this problem bother you as much now as it did six months ago? What more do you want? More memory, speed, storage? Better stores? Better software? Whatever, let us know.

Write to "Easier," Personal Computing, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604. (Or if you missed the essay, let us know and we'll send you a free copy.)

Charles of Martin

CHARLES L. MARTIN, EDITOR

Some samples from our library of over 489 disks for the IBM PC: Desk Organizer A great pop-up helper, phone dialer, note pad, calendar, and calculator.

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In addition, you can also choose a new option that lets you use 3.5-inch diskettes with your Personal Computer AT.

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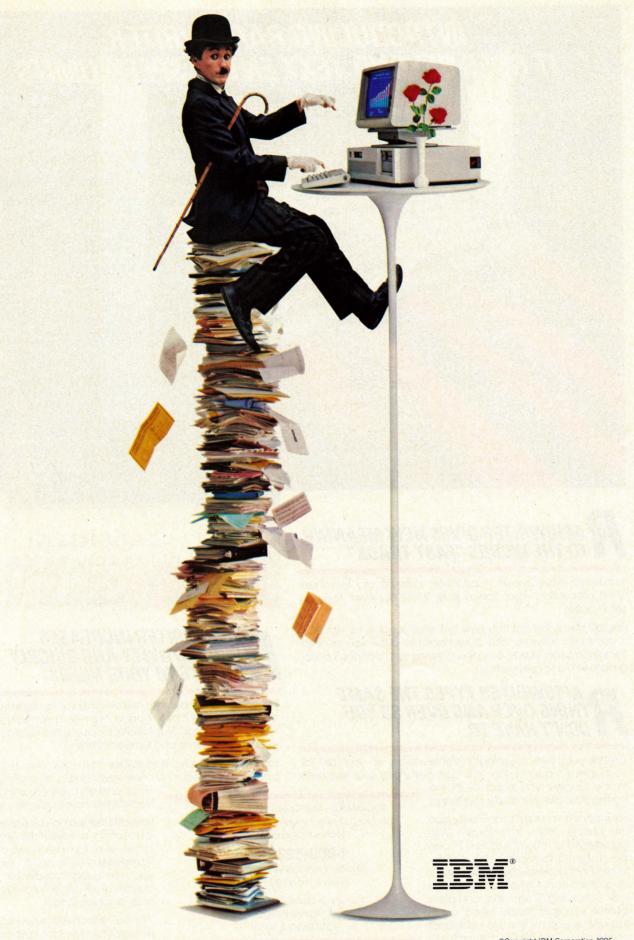
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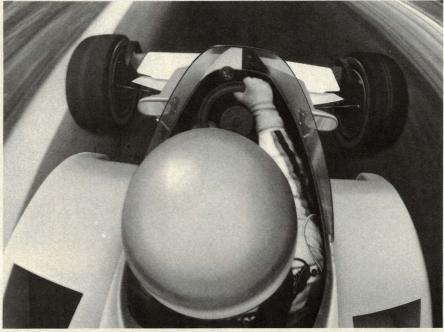
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YES

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YES

LETTERS

INQUIRING ABOUT COMPATIBLES

y wife and I have used NCR Decision Mate V Personal Computers running on MS-DOS 2.11 with 512k RAM and two 360k floppy disk drives for the past two years. The performance of the equipment has been outstanding for WordStar, InfoStar, SuperCalc and GWBasic applications.

As I browse through the software ads in Personal Computing and the other computer publications, I'm often attracted to utility, special application and window-type software. In the fine print at the bottom of the ads, I usually read that the software will run only on an IBM PC or "true" compatible. Since my computers are not "true" compatibles. I resume browsing.

Sometimes, the ads are not as definitive and will include a statement that the software will run on PC-/MS-DOS (or DOS 2.0 or later versions). For this type of ad, I will write to the software house and let them know that I am interested in their product.

I describe my hardware and operating system and inquire whether there is a version of the software that will run on my equipment. If so, I request additional literature, pricing and also shipping information.

Better than 50 percent of the time, I get no response. About 25 percent of the time, I receive a brochure that is no more informative than the ad which piqued my curiosity in the first place.

On rare occasions, I learn that the software will indeed run on my equipment and I place my order with some degree of confidence. The rest of the responses vary; such as, "We don't know,' "What's a Decision Mate?", "Our application runs on any operating system," and so on.

Sometimes, after I receive the software disk, I learn that to get started, I must press the Alt and Numlock (or whatever) keys together. Unfortunately, my keyboard has neither an Alt nor a Numlock key. I then go through the exercise of arranging for the return of the software and getting a refund.

It is hard to get the attention of the software producers and sellers if an individual or small-volume user does not have an IBM or "true" compatible personal computer. It would be nice to know if there are versions of the software that will run on a generic MS-DOS operating system.

I must add that over the past two

years Personal Computing has progressively improved its content and format for computer users who are between the novice and highly technical stages. The articles are very informative for those of us who have acquired a fairly sophisticated system and are now interested in improving our effectiveness and efficiency. The LETTERS and ANSWERS columns provide additional forums.

Your current editorial direction, policies and objectives seem to be right on target. Please continue.

John Jakab Dayton, OH

A DANGEROUS MOVE

The simple MOVE program described in "Add A Move Command To MS-DOS" (SHORTCUTS, February), is dangerous. If you enter an incorrect command, it will destroy all files covered by the first part of the command.

Your shortcut suggests setting up a simple batch file which will, with a single command, move a file from one location to another and delete the original file. The MOVE.BAT file goes like this:

COPY %1 %2 DEL %1

where %1 represents the original drive, file name, and extension in your command line; and %2 represents the target drive, file name, and extension.

If you have that two-line MOVE.BAT file available to you and type move FILENAME B:FILENAME, FILENAME is copied from your present directory to B:, then is erased on your present directory. Neat and simple.

But beware: this simple program has two dangerous flaws. If you specify an incorrect path name or if you don't specify a different location for the target file, you lose your file entirely. In the first instance, DOS gives an "Invalid directory" error message; in the second, the error message says "File cannot be copied onto itself." In both instances, the second part of the batch file then executes, thereby erasing your original file(s), leaving you with nothing. If you had typed MOVE *.COM HUGO*.* and if HUGO were a nonexistent directory or a misspelled directory name, you would have destroyed all the .com files in the current directory.

At least three public domain programs I've found attempt to deal with the problems of a MOVE command. Each has certain limitations.

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COMPAG

LETTERS

If there were a simple way to create a MOVE command with a batch file, then the operation might be helpful. Until someone comes upon that command, avoid MOVE.BAT. All it does is save you some typing, and the risk isn't worth the convenience.

> Bruce Jackson Buffalo, NY

Editor: You're right. The batch file we proposed for moving files from one location to another works, but does not work with enough caution to make its use advisable. We fashioned longer, more complex batch files in an attempt to create a foolproof MOVE command. Some of these batch files worked, but they involved so many instructions that it was faster simply to copy and erase the files to be moved. In the absence of a palatable homegrown MOVE command, we suggest you do without this modest timesaver or supplement MS-DOS with a file management program that contains a safe and effective MOVE command. Xtree (Executive Systems) and Keep Track (Finot Group), for example, both have such a command.

THE GNASHING OF TEETH

aving read the various responses to "Easier Computing" (ESSAY, January), I can empathize with the frustrations of those who are struggling with programs and manuals that often provide "cryptic" instructions. However, I also feel that individuals must recognize the fact that there will always be a certain amount of "gnashing of teeth" when learning a new skill, and this holds especially true for this first wave of computing pioneers such as themselves.

I found myself at odds with statements that refer to software and hardware vendors as "non-supportive" of their products. My experiences with software vendors, although decidedly mixed, have been for the most part excellent. I have specifically purchased products manufactured by companies that have a proven product and that have the industry strength to support their product (i.e, they will be around tomorrow).

My one gripe (and warning) relates to software and hardware for compatibles (specifically IBM compatibles). I would like to see [more extensive] software/ hardware compatibility statements accompanying the advertisements for a product. While most clones are "IBM-

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(For More Information Circle 59)

compatible" to the extent that they will run the "litmus test" programs (i.e., Flight Simulator, 1-2-3) there are a number of programs out there that many of us use or want to use on clone machines, which simply will not work.

With the mushrooming of less expensive IBM clones, this will continue to be a problem well into the future.

A.J. Grygiel Aurora, CO quick fix outlined in the story. The Twinriter 5 printer eliminates the need to reconfigure software, use two printer ports, and add cables and switching boxes; it also saves both space and money.

At least in the sidebar entitled "Other Printer Combos To Consider," where the author finally points to combinations that seem to "defy the need for two printers," mention of the new generation of dual-head printers should have been made.

Alex Schibanoff Operations Manager Information Systems, Peripherals Div. Brother International Corp. Piscataway, NJ

COMBINING PRINTERS

Your "Living With A Two-Printer Setup" article (PRODUCTIVITY, May) was very enjoyable. After a year of trial and error, I finally solved my printer problem with a Taxan KIF-4308 printer buffer with 256k of memory.

The Taxan is a versatile, fast printer buffer that has one input and two output ports which conform to the Centronics standard. It accepts the highspeed data sent from the computer. stores it, then retransmits the data at whatever speed the printer will accept. After data has been sent to the buffer, the computer can be doing other tasks while the printers work. Controls for switching printers, multiple copies, pause print, double printing (printing on both printers at the same time) and other features are located on the front of the buffer. Additionally, the buffer unit is small and will fit almost anywhere.

I have used this setup for over a year without problems. I use an IBM AT with an IBM Quietwriter, an Okidata 84 and a Brother HR-25.

Ralph Williams El Campo, TX

Editor: Taxan informs us that the correct name of this product is the Model 500 printer buffer. It acts as a printer buffer and A-B switch. Its price is \$299.

BROTHER'S TWINRITER 5

wour article entitled "Living With A Two-Printer Setup" (PRODUCTIVITY, May) leads your readers to believe that the only solution to acquiring true letter-quality characters, quick drafts and graphics is a two-printer setup. This is a misconception and unnecessary burden that Brother International has eliminated with the Twinriter 5, a dual-head dot matrix/daisywheel printer.

The real cure to the software, printer port, cabling, space and cost problem [your article addresses] is a dual-head printer such as the Twinriter 5, not the

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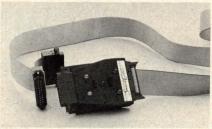
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LETTERS

Miami, FL

SIDEKICK'S DIALING FEATURES

our article (BENCHMARKS, April) comparing Spotlight to SideKick was very good. I do not use Spotlight, and indeed this is the first time that I've even heard of it. As for SideKick, I think it is a great tool.

The article did not mention a very useful feature found in the SideKick Dialer module. In this module, there are two search features, each of which remains active until it is cancelled, even if a number found by a search is dialed. You can "search initials" [anything starting in column onel or "search all." Search all is most useful because it finds a single character or group of characters even if the character set is a part of a word. Therefore, by careful planning you could mark all telephone numbers of a similar group of contacts with the identifying codes, and even mark each with more than one code if necessary. Timothy Brown

OWNING AN AMIGA

S ince you requested information [on computing achievements, what programs or applications readers use or plan on using during the next 12 months] from your readers (EDITOR'S NOTE, May), I am very happy to write.

I own the Amiga computer, Volksmodem 12, and Epson's Model JX-80 printer. I use Online communications software, Scribble word processing software, Deluxe Paint graphics, and other programs for entertainment.

The Amiga is the best personal computer on the market anywhere today, and I'm very proud of it. I guess I shouldn't expect everyone to be as proud as I am, because the only people who are, own one.

> Susan E. Siciliano Benbrook, TX

GREATER SPEED WITH MATH CHIPS

read your article, "Bigger, Faster Spreadsheets" (PRODUCTIVITY, May) with interest. However, in looking at the sidebar article "When Do You Need A Math Chip?" I have to take issue with your implied conclusion that a math chip doesn't do much for a spreadsheet that uses only basic math functions. I have a pro forma income statement and balance sheet worksheet program of a fairly good size (115,000-plus bytes) and have approximately halved the recalcu-

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Unlocking Those Popular Programs

UNLOCK is a series of single-purpose utility programs (Albums A, B and C) that make backup copies of certain copyprotected software; \$49.95 each, retail or mail order; TranSec Systems, Inc., 1802-200 University Dr., Plantation, FL 33322; (305) 474-7548

hate some of my favorite software, and I suspect I'm not alone in this paradoxical state of mind. What I hate. specifically, are the restrictions that copy protection puts on application software like Framework, Microsoft Word and Lotus 1-2-3. Copy protection makes programs difficult to install and inconvenient to use-especially with a hard disk or RAM disk. More importantly, copy-protection schemes can leave you without an emergency backup should something happen to the fragile program disk. Unlock, a "copy" program available from TranSec Systems, can change all that by effectively removing copy protection from a number of popular programs.

Unlock comes in three versions, or "albums," that work with three distinct groupings of copy-protected software. Album A is for use with Lotus 1-2-3. dBase III, Framework, Systat, Spotlight, Graphwriter, and Realia Cobol. Album B works with Symphony, Managing

Your Money, Clipper, DoubleDOS, Electric Desk, Smartwork and Data Base Manager II. Album C attends to Microsoft Word, IBM Writing Assistant, 1-2-3 Report Writer, ThinkTank, Paradox, PFS: Access and Multilink Advanced. At this writing, Unlock covers the latest releases of these programs.

Unlock's function in each album is to enable you to make "unprotected" copies of the original program disks. These unprotected copies have no traces of copy protection and therefore can be copied to another floppy disk, or hard disk, using MS-DOS commands like COPY and DISKCOPY. The original program disks, however, are not altered.

Unlock has two particularly endearing characteristics: it works, and works simply. There is no users manual; the on-screen instructions and menus are clear and adequate. I was able to quickly produce unprotected copies of Lotus 1-2-3 release 2, Symphony 1.1, Microsoft Word 2.0, dBase III 1.1, and Framework II. These copies performed flawlessly, as did copies of these copies.

The point of all this copying, of course, is to eliminate the hindrances of copy protection. This it does. The newly unprotected software can be easily copied to a hard disk or a RAM disk as often as necessary, and there's no need to keep a "key disk" in the floppy drive. Furthermore, any worries about losing crucial program files are alleviated altogether, since several backup copies are at your disposal.

-Christopher O'Malley

April 1986 PERSONAL COMPUTING

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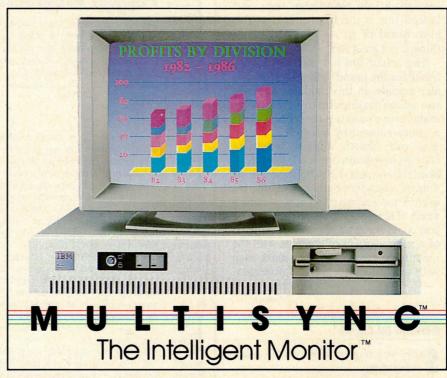
• MultiSync, the NEC feature that automatically adjusts to color adapter board scanning frequencies from 15.75 KHz to 35 KHz—suggesting the possibility that the MultiSync monitor might be compatible with all color graphics boards that are fully compatible with the IBM PC, PC/XT, and PC/AT, now and in the future.

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(For More Information Circle 41)

LETTERS

lation time by having the coprocessor available in my office PC XT. None of the functions I do in the worksheet are above basic math, but there are a significant number of calculations that need to be done.

Graphics programs are also greatly enhanced by use of the math coprocessor chip. The coprocessor speeds up the drawing and moving of figures on the screen by quite a margin.

A final point: you seem to be emphasizing the Intel chips in the article. Though I'm sure these are good chips, there are many [others] available, and at lower prices.

David B. Waechter Red Bank, NJ

THE MUSIC CONNECTION

read with interest your article entitled "The Music Connection" (LEISURE, January). You mention that Anthony Scelba, a professional musician, is "still looking for the perfect software" and that he has not found a program that does beamed notes. Mr. Scelba and your readers should be aware of the program, The Professional Composer, by Mark of the Unicorn in Cambridge, Massachusetts. This program is quite exceptional in its graphics capabilities and the quality of the final printed copy. Many programs seem to stress the composition and playback, but this program is truly for the composer who wishes a good quality printed copy. Features include beamed notes; laser printer support; ability to make customized changes by sending pages to MacPaint; integration of text and music with various fonts and styles available; note and symbol input via mouse and the keyboard or keyboard alone; practically any symbol needed for dynamics, articulations, ornamentation, clefs, barlines, jazz notation, etc.; ability to play back up to four voices; transposition; ability to extract parts from the score and insert multi-measure rests; headers and footers; title page; staff connection; capability for inputting any number of staves; and the ability to merge staffs to create piano reductions.

> Jane Frasier Englewood, CO

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TABLE 1 COMPARISON CHART RELATIVE RANK OF WP PACKAGES

HET CHANGE TO SERVE	COM RELATIVE F	PARISON C RANK OF W	IP PACKAG	ES M	ULTIMATE DVANTAGE	DISPLAY WRITE S VERS. 1	3
W	ORDSTAR	WORD VERS. 2.0	PERFE VERS.	4.1	VERS. 3.5	4	
	REL.2	2	3		2	3	
ATURE	1			2		burni awa	Variety d
nstallation	1	2		3	1		2
Documentation	1	2		2	3		3
Ease of Learning	1	2		1	3		the second
Functionality	2	2	e totale	2	1	in the s	2
Performance	1		3	2		4	2
Document Control	1		3	3		2	3
Text Control	2		1	2		3	3
Page Control	2		1	3		3	3
Micro Editing		1	2		3	2	1
Global Control		2	1		2	2	4
Page Layout		3	3		3	4	3
Printing		1	2		2	3	
Advanced Featu	res	3	1			2	
Meiting Aids			3		3	5	
Printers/Fonts	Supported	1	Δ		3	ompared to the	others.The pa nber.
Fillitation			L-tivo rat	king of eac	h package co	me ranking nur	liner.

Note: The comparison numbers represent the relative ranking of each package compared to the others. The package with the highest ranking is given a 1. If packages rank equally, they are assigned the same ranking number. Source: InfoCorp Connectability

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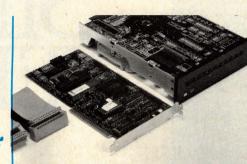
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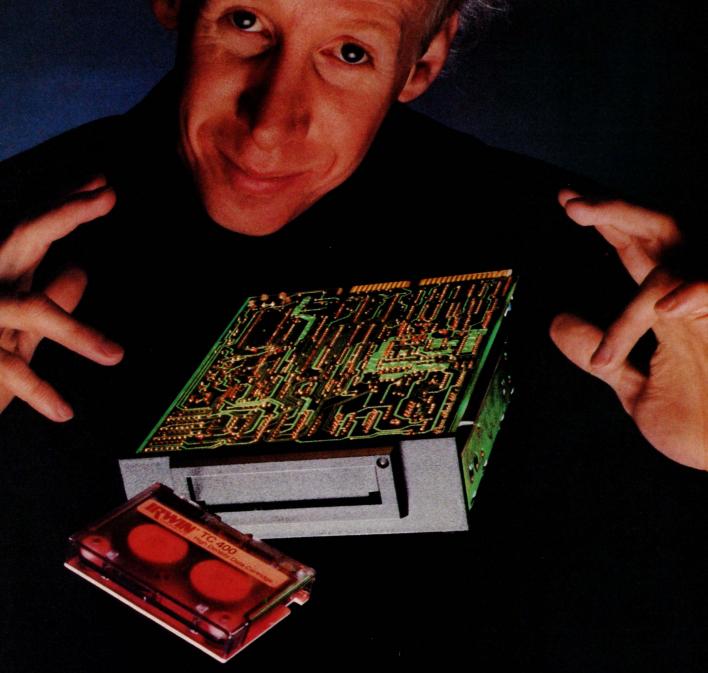


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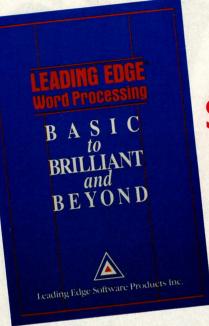
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Notes From

The Under-

ground

Expanding your personal computer's memory and tapping this newfound RAM reservoir with memory-resident programs is a tricky can of worms, as the continuing story of Charles Campbell, direc-

Spreadsheets In Expanded Memory

tor of the New York affiliate of the American Heart Association (see SPECIAL REPORT, March), reveals. He has created an 800k "master spreadsheet" to keep the affiliate's 1986-87 budget in line, with the help of Lotus 1-2-3 and the two megabytes of expanded memory that an Above Board card supplies to his IBM PC AT. But for a while, he thought it was at the sacrifice of one of his memory-resident programs.

In preparing the organization's \$6 million budget for the coming fiscal year, Campbell meshed financial worksheets from four departments into a single 1-2-3 spreadsheet to get a better perspective on the bottom line and to ensure the accuracy of the numbers in the budget proposal. Campbell thought that Note-It (version 2.0), a "documentation" acces-

sory tailored to 1-2-3, was running into difficulty working with worksheets that wandered into expanded memory. A scrambled array of symbols and characters was replacing the contents of some of Campbell's worksheet cells. Note-It's producer, Turner Hall Publishing, sent along a fresh version of the program, but Campbell still wound up with some mangled cells when he began combining worksheets.

Facing budget deadlines, Campbell kept SideKick and SuperKey in his RAM-resident lineup, but dropped Note-It. To jog his memory in its stead, Camp-



Charles Campbell explores the outer limits of RAM.

bell reverted to scribbling the whys and wherefores of his giant budget spreadsheet on a legal pad. Though this method of merging four worksheets into a super-spreadsheet was "awkward," says Campbell, it worked. For example, the master spreadsheet helped him uncover a \$50,000 discrepancy between departmental salary budgets and the total salary allocations available. A section of his master spreadsheet he refers to as his "control panel" automatically compares key components of the worksheet for such cross-checks. "I, don't like people spending more money than they've got," Campbell says with a touch of understatement. In the end, his budget proposal went "upstairs" and received the board of directors' approval.

Life with such a huge spreadsheet makes Campbell fidgety. Recalculations are slower; loading and saving the worksheet takes long enough for him to get a cup of coffee before and after his number crunching. Campbell believes he is perilously close to the practical limitations of 1-2-3 worksheet size,

but he has no troubles now. Best of all, Campbell recently found that Note-It works in expanded memory after all. The problem was never with the utility, but with the version (1.0) of Above Board software Campbell was using. Having upgraded to version 3.2, which is available free for registered users (call Intel at 800-538-3373), Campbell has gotten his revered Note-It back again.

Take Three For The DG/ One: Model 2

■ One month after IBM unveiled its LCD-based PC Convertible, and eighteen months after the introduction of the DG/One laptop, Data General Corp., of Westboro, Mass., has brought out the DG/One Model

2. Finally, Data General officials have acknowledged that even portable computer users deserve a decent display. The \$4,000 top-of-the-line Model 2 EL has an eminently readable 25-line-by-80-column electroluminescent display and an internal 10Mb hard disk. (See PRODUCT REVIEWS.) Without the hard disk, the machine is \$2,800 (one disk drive). LCD versions of the Model 2 range between \$2,000 and \$3,000, and all new DG/Ones have a new keyboard that adds separate "+" and "-" keys. For owners of the now-discontinued original DG/One—dropped in price to \$1,500—there is a \$600 upgrade to the latest LCD screen, but no path to electroluminescence.

This latest chapter in the short but active history of the DG/One—this is the third LCD screen, for example—is also remarkable for what it has not included. The three-pound external nickel-cadmium battery for the EL model won't be available until August. As for compatibility with IBM's Convertible, Data General is saying the two machines can read and write each other's data disks, but some programs—particularly graphics software written for the DG/One—will appear squashed on the Convertible's shorter screen.

WordStar II

Look for a new version of the venerable word processing workhorse

before year end, says Micropro spokesman Lee Lensky. And count on it to circumvent at least one longtime drawback from WordStar's CP/M roots: the 64k-at-a-time program and file loading limit that causes frequent disk access. Lensky won't talk about specific features. He does make reference to advanced printer-handling capabilities like those in WordStar 2000. He says the new WordStar will take advantage of current hardware technology and processing speed. "We're not just trying to catch up, we're trying to get ahead," he says.

Easy Add-Ons

■ DAC has a new utility series for its accounting and payroll software. Easy Mate (\$40) is an add-on that provides a "road map" feature for

entering and switching between Easy Accounting modules. It's useful too for setting screen colors and intensities, accessing windows, creating multiple reports, writing macros and

DEBORAH FEINGO

UPDATE

doing calculations on-screen. Easy Port (\$30) enables the company's accounting and payroll program data to be exported to 1-2-3 and other spreadsheets. DAC is also offering \$20 tutorials for both Payroll and Accounting.

The Resurrection Of Sanyo

Aiming to reestablish itself as a player in the marketplace, Sanyo Business Systems, of Moonachie, N.J., is off to a tenuous rebirth, despite the new leadership of Ericsson veteran Lou Leonardo. The first few

hundred of Sanyo's AT-compatible 990 computers were shipped in May with ROM chips that only worked with 10 or 20Mb hard disks. New ones to work with higher-capacity hard disks are now available and are being shipped with the machines, along with instructions for users to make the change. Furthermore, the 990 only works with extended memory boards from Intel and AST when running at 8MHz. The 990 works with other extended memory boards when running at the 6MHz clock speed. Board manufacturers are making changes to the boards to work at the faster speed, according to Leonardo. A bug in the operating system—also apparently being corrected—causes SideKick to take about four times longer to load than on other computers. So far, this is the only program Sanyo has identified as having this problem. In defense of the machine and its maker, Leonardo notes that in the past, fixing such bugs would have taken Sanvo six months, while now the attention is immediate. And, he notes, the stripped-for-action (512k of RAM, single 1.2Mb disk drive) \$3,000 machine is a speed demon. Sanyo also has a new 20Mb hard disk version of its transportable PCcompatible for \$2,500, and is packaging an XT-compatible machine in a retail, point-of-purchase system.

Hardware Update . . .

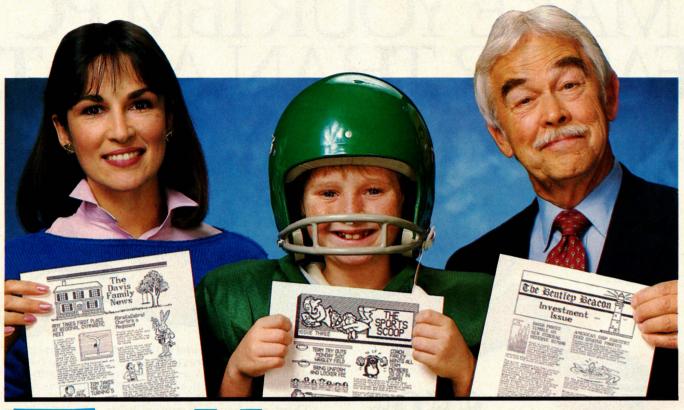
Cordata, of Thousand Oaks, Calif., has beefed up the RAM and storage capacities and trimmed the prices of its personal computers. The

PC-25 (\$1,500) desktop model now includes 512k of RAM, a 14-inch monitor, and Electric Desk integrated software. The PC-205 (\$2,000) has a 20Mb hard disk, a single floppy drive, 512k of RAM, and a 14-inch monitor. Cordata's ATcompatibles, the ATD-8 series, have also dropped in price: \$3,700 for the 20Mb hard disk version; \$7,000 for the 40Mb version. The PPC-25 transportable (\$1,500) now has 512k of RAM and Electronic Desk software. The PPC-205 (\$2,000) now includes a 20Mb hard disk and 512k of RAM. The 286based ATP-8-Q20 transportable with 20Mb hard disk now costs \$3,900... The ITT XTRA XP, an IBM PC XT-compatible from ITT in San Jose, Calif., with 512k of RAM, 20Mb hard disk and 14-inch monitor, has been reduced to \$3,500. ITT's XTRA Model II, with 256k of RAM, 10Mb hard disk and 14inch monitor, is now priced at \$2,565... Victor Technologies of Scotts Valley, Calif., is now offering a 30-day, money-back guarantee on its V286 AT-compatible computer and VPC II XT-compatible computer . . . Zenith Data Systems in Glenview, Ill., has dropped the price of the Z-158 PX XT compatible with 20Mb hard disk to \$2,800. The price of the **Z-200** with 20Mb hard disk is now \$4,500 . . . Thomson Consumer Products Corp. in Culver City, Calif., has upgraded five of its color monitors to receive RGB analog signals and display 4,096 colors. The monitors also accept RGB digital signals that limit the number of displayable colors to 16. The upgraded monitors are the CM36512VI (\$429), CM31481VI (\$449), CM36432SI (\$449), CM36382SI (\$549) and CM31311SI (\$599)...Juki Office Machines Corp. in Torrance, Calif., has introduced a seven-color version of its 5510 dot matrix printer (\$650)...NEC of Elk Grove Village, Ill., has announced vertical market software to enhance the NEC PC-8400 Laptop Portable: Insurance, Real Estate and Financial.

... Software Update

■ Keyworks 2.0 macro utility (\$90), from Alpha Software Corp., Burlington, Mass., now has cut and paste, keystroke recall, printer control,

dates and times, a full-screen menu editor and automatic macro deletion; it's \$20 for current users . . . FAB Software, of Wayland, Mass., has version 3.0 of the NewKey macro processor now with multicharacter macro names, macro descriptions, cut and paste, a 128-keystroke type-ahead buffer, and more ... Softstyle of Honolulu, Hawaii, has released Printworks for Lasers 2.1 (\$125), featuring new typesettinglike functions, laser-printer support for IBM Displaywrite 3. and support for LaserJet 500 Plus, Xerox 4045 Laser CP, and NCR 6416 lasers. Users can send \$8 and the original disk for the update . . . Scarborough Systems of Tarrytown, N.Y., has updated the \$40 MasterType, a typing tutor, to include graphically enhanced finger positioning charts, more sentence typing practice, and other improvements, and can be obtained by users for \$10 ... Broderbund Software of San Rafael now offers The Print Shop Companion (\$35) and Bank Street Speller (\$50) for the Commodore 64/128 computers, and The Print Shop Graphics Library Disk 2 (\$35) for IBM . . . Map Builder 2.0 (\$250, plus \$150 for county boundaries) has been announced by Geosoft Corp. of Vernon, Conn., now supporting mapping at the county level, and featuring more detailed state boundaries. Users can update for \$50... Mosaic Software, Inc., Cambridge, Mass., says their Twin spreadsheet is now being bundled with Promark's Report Writer, which has an interface to spreadsheets via DIF files; the combined package is \$395. The Twin also will be bundled with Vutek Systems' Monographics Card line ... Palantir Software, Houston, Texas, has released Word Processor version 3.0 (\$400), which now includes the Palantir Speller and such features as column manipulation, horizontal and vertical line drawing for graphic applications, enhanced menus, and built-in DOS commands. Users who now have Word Processor and Palantir Speller can update for \$75; those who have only Word Processor, for \$100 . . . Dow Jones, Princeton, N.J., Market Analyzer Plus (\$450) has enhanced graphics capabilities. The upgrade is priced at \$225 ... CompuView Products, Inc., of Ann Arbor, Mich., has reduced the price of V-Spell spelling checker from \$125 to \$79... Writer's Helper (\$120) idea organizer for students is now available in Apple ProDOS and IBM versions ... ProComm communications program version 2.3, from PIL Software Systems of Columbia, Mo., supports file transfer protocols, emulates many display terminals, and now has a "host mode"; it's free to all registered users... version 2.0 of Timetrak (\$100), a memory-resident time/expense tracking utility from Thomas Systems, Minneapolis, Minn., features an autolog file and the ability to load data directly from previous records. Owners of 1.0 can upgrade for \$60 plus shipping and handling ... LanLink, from Software Link., Inc., Atlanta, Ga., release 1.30 now has a server status screen that keeps the network administrator informed of network satellite activity, improved filesharing capabilities, an automatic dial-up facility for remote satellite users and a reduced price of \$99,



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Grid Makes A Comeback



by Richard A. Shaffer

rid Systems Corp. likes to think of its products as the Jeeps of computing—mobile, powerful and built to take it. But they look more like exhibits in the Museum of Modern Art's collection of design objects. When the company's first laptop was introduced in 1982, *Business Week* tagged the sleek, \$7,000 machine the Porsche of personal computers, and ever since, the company has had difficulty persuading potential buyers that Grids are more than high-tech status symbols.

But it is beginning to succeed. Ironically, Grid Systems is coming into its own just as an extremely powerful competitor enters the laptop market—IBM.

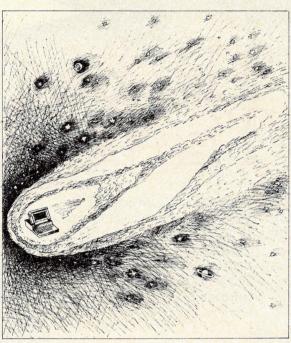
In its six-year history, Grid has had monthly profits once in a while, and even an occasional quarterly profit. Now, however,

Grid has maintained a profit for nine months and expects its first annual profit for the fiscal year ending this summer. It could earn about \$5 million before taxes in fiscal 1986.

Grid hardly seems likely to fulfill the billion-dollar dreams of its founders and become another Apple or a Hewlett-Packard. But it also has sidestepped the fate of Gavilan, Osborne and others by lowering its expectations, changing management, controlling expenses, rethinking its products and focusing on very specific markets—such as the military and national security markets, or traveling auditors—where price is less important than performance.

Grid could fail yet, of course, or collapse under the weight of IBM competition. Although Grid is a private company and it doesn't report its financial performance, I estimate that it has lost almost two-thirds of the \$35 million invested in it. It will be a long while before accumulated profits can overcome that deficit. In addition, the price of the company's stock, as measured by private

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placements, is about a third of what it was only three years ago. But Grid's history makes an interesting case study in how a company can recover from a disappointing start and loss of direction.

One of the company's initial problems was that its high-performance computers didn't perform; the software was too large for the machine's memory, leaving the user with little workspace. The solution was obvious, but it took nearly half a year to shrink the programs and enlarge the memory. In addition, Grid couldn't get enough of some critical parts—the flat video screens and the driver circuits for them.

Lack of sales was the big problem, however. Instead of going through retail stores, Grid had decided to send its own troops to call on large customers, the way IBM, Burroughs and so many others do. When not enough orders came in, it was stuck with the high marketing expense that burdens every direct sales organization until it begins to get repeat business. By Spring 1983, revenue was 40 percent below plan, but losses were running 50 percent higher. Nearly a year after the Compass computer had been sent to beta sites for testing, Grid was expecting to sell \$2 million worth of

them a month for a profit of about \$11,000. Instead, it was burning through about \$450,000 a month. The company turned to retail, but Grid's laptop also was a dud in computer stores and the company spent millions for advertising in *BusinessWeek* and in *The Wall Street Journal* that brought them few customers.

Although its programs were available only in English, Grid expanded internationally, draining more cash for offices and staff but producing little revenue.

Grid came to realize that its own mindset was one of its biggest obstacles. It thought of itself as a failure, because it kept comparing its performance to the wild revenue growth of such companies as Apple. By more reasonable measures, Grid wasn't doing all that badly, says Sam Wiegand, the fei-

sty optimist and former Tandem marketeer who took over the helm at Grid in January 1984. Instead of winding the company down, Wiegand focused on marketing and expense control.

The turnaround began in mid-1985 after the introduction of GridCase, the IBM compatible (priced at between \$3,000 and \$5,000, depending on the configuration). Companies that had refused to consider Grid began listening to its pitch. Repeat business started, the size of the average order began to climb, and industrial companies as well as government agencies started buying Grids.

As a consequence, the company's sales reached \$33 million in fiscal 1985 and seem headed for \$60 million this year. Management is forecasting \$90 million in sales for fiscal 1987 and sales of \$130 million to \$140 million the following year.

What could upset the forecast? Not IBM, I think. Grid undoubtedly will lose a number of orders to IBM, just as it lost a major contract with the IRS earlier this year to Zenith, which makes an IBM-compatible laptop. But for the customer who needs both portability and a bright screen, Grid is at present the best choice.

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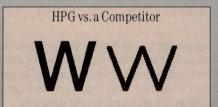
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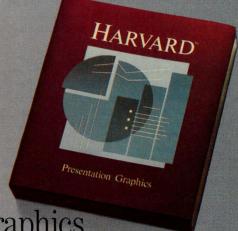
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BENCHMARKS / Personal Computing's Performance Guide

Dueling Dictionaries

t doesn't matter what your profession, age, sex, or IQ is. You always misspell or misuse certain words. Some people don't know there's a second m in accommodate. Most of us can only guess at where all the letters go in hors d'oeuvres. The first r in surprise is a surprise to many.

If the list of spelling demons is long, the list of words we misuse or overuse is, too. While there's nothing wrong with saying you're "happy" to report higher profits or lower expenses, "happy" is such an average word. Ditto for words like money and believe.

Keeping a dictionary and thesaurus on your desk is one way to improve your vocabulary and spelling. Users of personal computers, though, have another option: software that puts both a spelling checker and a thesaurus at their fingertips. Some are included with word processors, some are stand-alone programs that you load after completing a document. The newest are RAM-resident programs that sit on top of other programs until you need them.

Reference Set and Turbo Lightning fall into the latter category. In addition to being RAM-resident and selling for under \$100, the two three-disk sets are based on the same Random House dictionary and thesaurus. The way the two programs work, though, is more dissimilar than similar.

One significant difference is Turbo Lightning's "on-the-fly" spelling checker, which beeps every time you type a word it finds suspicious. While its main dictionary has up to 80,000 words, Turbo Lightning uses one of its three smaller dictionaries of 6,000, 12,000 or 16,000 words for "on-the-fly" checking. It's not uncommon, therefore, for correctly spelled words to cause beeps. Mercifully, "on-the-fly" checking can be disabled if the constant beeping really gets to you.

If you decide against true instant checking with Turbo Lightning, you can still quickly check the spelling of any single word (if the cursor is on it) or use its full-screen-checking options. From a menu or through a "hot" key (usually Alt in combination with another key),

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FEATURES	TURBO LIGHTNING	REFERENCE SET
Memory Required	83-106k	26-43k
Price	\$99	\$89
Built-In Word- Processor Configurations	WordStar, MultiMate, PFS:Write, Microsoft Word, DisplayWrite, WordPerfect, VolksWriter Deluxe	FreeStyle, Microsoft Word, OfficeWriter, PC-Write, Super Writer, VisiWord Plus, WordMarc, Word Plus PC, WordStar 2000 IBM Writing Assistant, MultiMate, Palantir, PFS:Write, TVX, VolksWriter, WordPerfect, WordStar

Functions

FEATURES	TURBO LIGHTNING	REFERENCE SET
On-The-Fly Spelling Checker	Yes	No
Word And Screen Checking	Yes	Yes
Create Auxiliary Dictionaries	Yes	Yes
Change Activation Keys	Yes	Yes
Full-Document Checking	No	Yes

Options

FEATURES	TURBO LIGHTNING	REFERENCE SET	
Number Of Words In	50,000 (109k)	50,000 (117k)	
Dictionary	80,000 (180k)	80,000 (188k)	
On-The-Fly Dictionaries	6,000 (16k)	None	
	12,000 (29k)		
	16,000 (39k)		
Auxiliary Dictionaries	Multiple, up to 2,000	One, up to 4,000	
	characters or	words	
	300 words each		
Record Macros	No	Yes	
Number Of Root Words In Thesaurus	5,000	5,000	

full-screen-check highlights every misspelled word on a screen. Many users will find it maddening that the highlighting disappears as soon as you touch any key.

Reference Set doesn't come with "onthe-fly" spell checking; but it, too, can check any individual word or a screen full. Its full-screen-check works in the same way as Turbo Lightning's. The fact that highlighting disappears means that users of either program have to try to recall the misspelled words or run the screen check several times if several words are misspelled.

(Continued on page 138)

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Copy Protection On Hard Disks



by Miriam Liskin

nyone who has owned an Apple computer has grown to know, although likely not love, the phenomenon of copy protection. With so many low-priced game programs inviting piracy, it is not surprising that software companies attempted to protect their investment in research and development by preventing their products from being illegally duplicated.

In addition, the Apple II disk drive lent itself readily to the development of more sophisticated—some might say bizarre—copyprotection schemes not possible on other hardware, such as writing the disk directory (the "catalog") in a nonstandard location, storing data on the "half-tracks" or even "quarter-tracks" between the normal data track locations, recording some tracks backwards, using nonstandard sector formats, and syn-

chronizing tracks. In order to read these special formats, the protected programs provided a modified version of the disk operating system.

On the IBM PC, the widespread use of copy protection is a more recent development. One reason is that the IBM PC and its operating system had its roots in the preceding generation of business and professionally oriented CP/M machines. Business users were thought to be less likely to copy an accounting program than hobbyists were to pirate game software. This theory was based partly on the notion that businesses were less likely to condone the theft of software, and partly on purely practical considerations. With a complex business software product, the value of printed documentation and the importance of being able to receive support from the manufacturer in the form of technical assistance and program updates were thought to outweigh the savings gained by copying the

In practice, however, there are plenty

Miriam Liskin, a Berkeley, Calif. writer and consultant, is the author of Advanced dbase III: PROGRAMMING AND TECHNIQUES.



of illegal copies of unprotected programs like WordStar and dBase II. In a large corporation, one user may make a copy for the person in the next office, take a copy to use at home, or keep a copy of the program when he or she quits and goes to work for another company. A person who already knows how to use a program may not need documentation, and a novice can find help in the form of numerous books on all the popular software packages. This kind of piracy may not be officially condoned by management, but there is no denying its existence, and to combat it, copy protection has become a fact of life in the IBM PC-compatible world.

Leaving the ethical issues aside, copy protection is much more of a nuisance on a hard disk system than it is with programs that are self-contained on one floppy disk. One of the most common motivations for buying a hard disk is the convenience of not having to constantly shuffle floppies. Yet many of the early protection schemes employed nonstandard disk formats or deliberate physical damage to the disk (like the laser holes used by the ProLok copy-protection scheme). These methods of protection require that the protected "key disk" be

inserted in the floppy drive when the program is first started up; although in most cases, it can be removed once the program has been loaded into memory and has checked the floppy for the anticipated "defective" sector(s). For anyone who owns two or three such protected programs, it can be quite an inconvenience to have to swap key disks every time you want to switch programs.

If anything, the inconvenience of having to use a key disk to run some of the most popular programs from a hard disk served to legitimize the discovery and use of methods for "breaking" the various protection schemes. Before, the escalating war between the pirates and the software companies had clearly drawn ethical lines. But now, otherwise scrupulously honest individuals who would

equate copying a friend's disk and photocopying the documentation with stealing the package from the computer store find themselves searching on electronic bulletin boards for patches that will allow them to run their legitimately purchased copies of Microsoft Word, dBase III and Lotus 1-2-3 from a hard disk without a key disk.

The pressure to eliminate the annoyance of the key disk motivated the design of the next generation of copy protection schemes. These, typified by ProLok, allow you to install the software onto a hard disk a specified number of times, or make a given number of legal working copies on floppies. Once the program is installed, you can run the software without the key disk; but these new copy-protection schemes give the unwary user the potential to destroy one of these legitimately produced copies.

The programs protected in this way include some of the most popular software packages on the market today—dBase III Plus, the new versions of Lotus's 1-2-3 and Symphony, Microsoft Word 2.0, and the Clipper compiler for dBase III. While the installation programs provided with these packages vary somewhat, they all do basically the

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same thing. The key to understanding how to safely manage your hard disk is to understand what the installation routines are doing—an assignment that is complicated by the fact that the installation is carried out by a program, not a batch file (which you could TYPE out and study). You will, in fact, find an installation batch file, but the bulk of the installation is done by a program called up by the batch file.

With all of these programs, you are instructed to create a sub-directory for the software if you wish, and switch to this directory before beginning the installation. The installation programs copy all of the needed program files from the distribution disk(s) into the current sub-directory on the hard disk. You can confirm this by displaying the directory after the entire procedure is complete.

hey also do one other important thing that you may not realize: they copy several "hidden" files onto your hard disk, usually placing the files in the root directory. In some cases, one or more of the program files copied from the floppy disk are also given the "readonly" attribute, which prevents them from being erased or overwritten.

So that multiple protected software packages may coexist on the same hard disk, the Superlok copy-protection scheme gives unique names to the hidden files required for each application. You can unravel the mystery of which files belong to which application by checking the time and date stamps of the hidden files in the extended directory listing-these will match the time and date you installed the program.

Because the hidden files are not displayed by the MS-DOS DIR command, you may not be aware of their existence, but they are essential for running the copy-protected software from the hard disk without a key disk in drive A:. Once you understand how this copyprotection system works, you will realize that reformatting the hard disk destroys these hidden files and disables the software, even if you have backed up the program files to a floppy disk first.

Your first line of defense against disaster is to always know exactly what files are present on your hard disk. To help you accomplish this objective, there are a number of "extended directory" utility programs available that display all of the files on a disk, including those marked as "hidden" or "system." These utilities also allow you to

examine any other special attributes assigned to a file, such as "read-only" status. Although you will find commercial software for this purpose, some of the best directory utilities are public domain programs that can be had for the cost of a diskette from a users group or the cost of a local telephone call from an electronic bulletin board.

This type of copy-protection scheme was designed to allow for any number of installations, with the number at the discretion of the software vendor. The programs maintain a count of how many times the program has been installed, and as the special hidden files are copied to the hard disk, the count on the floppy disk is updated to reflect the latest instal-



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lation. When you begin the installation, you are informed how many times you will be able to perform the procedure. In most cases, you will find that the vendor has set the maximum number of installations to 1. If you try to repeat the procedure, you will be informed that the software has already been installed and cannot be installed again.

With some programs, such as Microsoft Word 2.0, the hard disk drive identifier ("C:" or "D:", for example) is also recorded in one of the hidden files. so if your hard disk was designated as drive C: when you installed the program, it will no longer run if your hard disk is later identified as D:. This situation occurs more often than the designers of these copy-protection schemes were apparently able to foresee. For example, adding some RAM disks to your system gives you a virtual disk designated as drive C:, and turns your hard disk to drive D:. This can be even more troublesome if you want to use the software on a removable cartridge disk system like a dual-drive Iomega Bernoulli Box, where a copy of Word installed on a cartridge in drive C: will not work if you place the same cartridge in drive D:.

Although at first, your attention is naturally focused on how to get a working copy of a software package onto a hard disk, it is equally important that there also be a way to remove the programs from the hard disk. For example, you may not be using the software very often, and you may want to reclaim the disk space for another application. You may want to move the program from one computer in your office to another, or you may be upgrading to a new computer and selling your old one.

In order to move a copy of the protected software from one hard disk to another, or to switch from running a program like Word on drive C: to drive D:, you must "uninstall" the program from the original hard disk, and then reinstall it on the new one. The uninstall procedure disables the copy of the program on the hard disk by making the appropriate alterations to the hidden files, deleting "read-only" files, after which it resets the installation count on the floppy disk so that the program may be installed again.

Obviously, you must also uninstall the software before reformatting or replacing the hard disk. Of course, if a hardware or software failure destroys the hidden files themselves, or if the directory tracks on the hard disk are damaged in a system crash so that you cannot access any files at all, you will not be able to uninstall the program.

You do have some protection against this type of disaster. In most cases, you can still run the program from the floppy disk used for the original installation, although you cannot reinstall it onto another hard disk. You can also copy the program files onto your hard disk and run the software with the floppy in drive A: as a key disk. Finally, most software vendors provide a backup copy of the protected program disk, from which you can perform another installation, or which you can use to run the software.

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- 4. At the U# = prompt, enter XJM11941, GENIE then RETURN.

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TIPS

to move the program from one computer to another, or to prepare for reformatting your hard disk. In some cases, therefore, the hidden files are not actually removed from the hard disk by the default uninstall procedure. If you are only trying to remove the program temporarily to make room for running some big job, you will find that you cannot reinstall the software on the same hard disk—the installation routine will find the hidden files present and inform you that the program is already installed. Yet you will not be able to run it, because the uninstall routine has disabled the working copy. Some programs require that you specify a special option in the uninstall program to purge the hidden files from your hard disk.

ou might also occasionally want to get rid of a program entirely, because you don't like it and have decided not to use it anymore. But because one of the program files has been marked "read-only" and cannot be erased, you will be unable to erase the application and remove the directory in which it resided. If you have little experience with read-only files, the DOS error message you'll see if you try to erase the file can be especially confusing: instead of saying something like "File is readonly" or "File cannot be erased," the operating system displays the message "File not found," which contradicts what you will see if you opt to display the disk directory.

Even if you are sure that you will never want to use a program again, uninstalling it is always a safer choice than destroying it completely. If you insist, however, and your uninstall routine leaves you with read-only files remaining on your hard disk, you will also find some excellent public domain utility programs that allow you to display and optionally alter the various attributes. You can use a program like this to remove the "readonly" status of a file, "unhide" a hidden file (i.e., make it appear in your directory listings), or you can even hide some of your own files or protect them from accidental erasure.

Regardless of exactly how the uninstall program works, there is another potential problem. With some Superlok-protected programs, the uninstall option that purges the hidden files removes all hidden files generated by any Superlok installation, so you must proceed with extreme caution if you have other protected programs on the same hard disk. To avoid destroying the other

programs, you must follow a carefully prescribed sequence. First, uninstall all of your other protected programs. Then uninstall the program you want to permanently remove from the hard disk, using the "purge" option. Finally, reinstall all of the protected programs you want to keep.

You can try a similar sequence if your hard disk must be reformatted because of a hardware or software crash. Depending on the nature and location of the damage, you may have varying degrees of luck with the attempt. If the directory or FAT (file allocation table) is badly damaged, you may not be able to access any of the files on the disk, and you may have no recourse but to reformat and reinstall the software from your backup program disk. If, however, using certain data files generates error messages but you can display the disk directory and access other files, you may be able to uninstall all or at least some of your protected software before reformatting the disk. Since this is a "last resort" attempt, don't be afraid to try responding "Ignore" to any DOS "Abort, Retry or Ignore?" error messages when you try to display the directory or access the uninstall routine.

Contrary to most of the advice you'll read on the subject of backing up your hard disk, you cannot defend yourself against losing your protected programs by using BACKUP to copy the contents of the hard disk onto floppies. This is because copying the protected files back onto the hard disk with RESTORE will almost always result in a nonfunctional copy of the program.

This precaution on the part of the software vendors should not be too surprising. If the BACKUP/RESTORE sequence did not disable the software, you could use this method to defeat the protection scheme and transfer a copy of the program to a friend's hard disk. Since the protected files reside in the root directory, you can safely use BACKUP and RESTORE to copy the contents of any subdirectory on the hard disk, but you should never use restore from the root directory without first uninstalling any protected software from your hard disk.

If you work with protected software on a hard disk, you will find that arming yourself with a good extended directory utility, reading the installation (and uninstallation) instructions carefully, and making it a point to always understand what files are present on your hard disk will go a long way toward helping to avoid problems.

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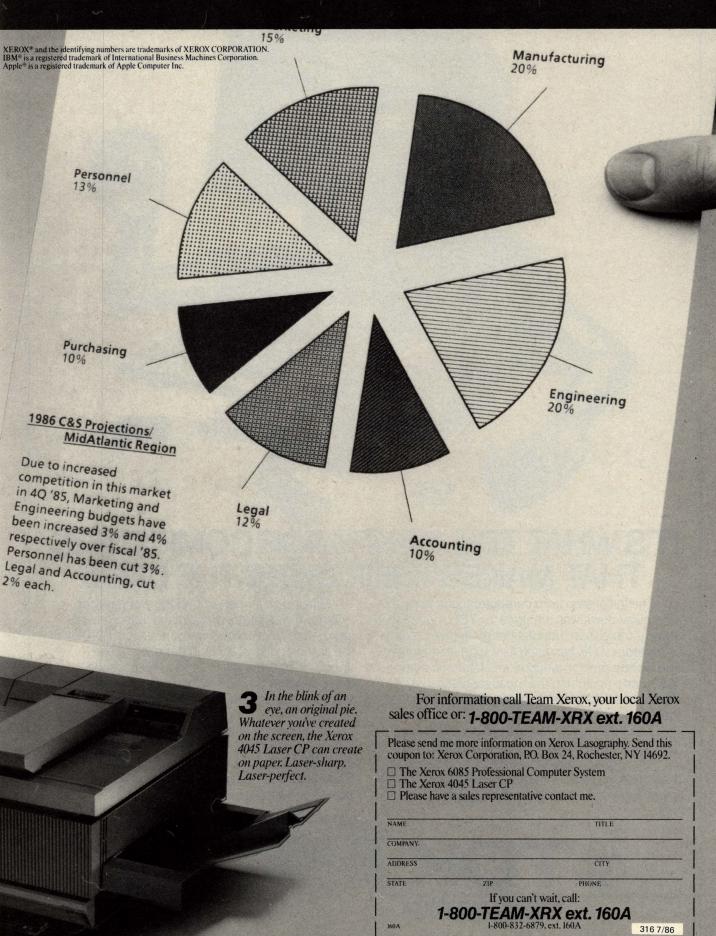
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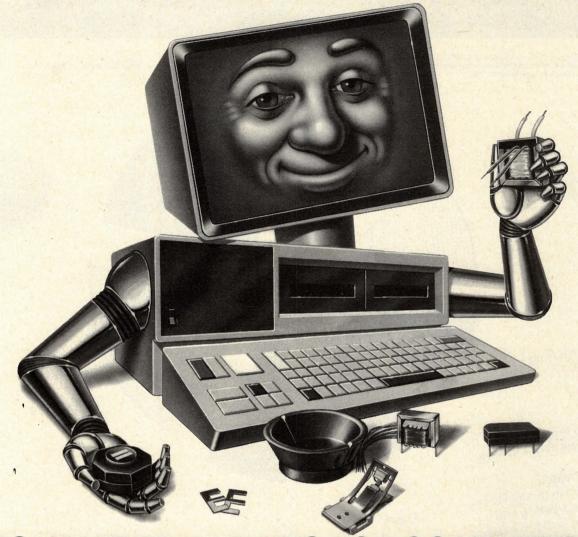
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 Complete payment information on voucher stub checks
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 Writes automatic payables schedule
 Automatic vouchers for recurring items
 Allows partial payments
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 Reports, Aged Cash Requirements, Vendor History
 Report, Check Register, Checks, Summary of Accounts Distribution Vendor List, Account List

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- rates

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 Specify any 3 invoice aging periods

 Print statements at any interval

 THE A/R posts cash receipts or invoices to customer accounts, types customer statements and reminder notices, and organizes and prints management information reports

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 Reports Include: Aged Trial Balance, On-Line Enquiry, Batch Proof, Accounts Distribution Report, Customer Statements, Customer Lists, Invoice & Cash Batch Proof, General Ledger Update

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THE Order Entry:

- Processes invoices singly or in batches
 Up to 99 lines items per order
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 THE O/E system automatically shows customer credit rating
 Each invoice depletes THE Inventory automatically
 Sends accounting transactions to THE Accounts Receivable
 Assign separate line item amounts to independent sales and receivables accounts
 Checks stock quantities in THE Inventory and notifies you when back orders are required
 Stock depletions will be automatically reported in THE Inventory
 Detailed invoice information

- Detailed invoice information
 The Order Report provides urgent information on

THE Inventory:

- Perfectly suited to retail environment
 Simple transactions for: addition, deletion, alteration and examination
 Complete current statistics on each inventory item
 Activity statistics for current or to-date period
 Instant on-line inquiries
 Optional hard copy record of all inventory transactions for auditing
 13 digit, user-definable alphanumeric part number
 30 character description field
 Reports include: Activity Report, Valuation Report,
 Auditability Proof, Reorder Report, Item List, and
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THE Payroll:

- Handles any combination of weekly, biweekly, semimonthly & monthly pay schedules
 Define up to 20 earning or deduction categories for all employees
 Assign any 8 categories for each employee
 Accountants can perform after-the-fact payroll

- processing Prints information for government reports Salary expenses can be distributed to different departments, branches or profit centers System includes safeguards and verification

- System includes safeguards and verification procedures Reports Include: Company History, Pay Transaction Proof, Calculations Proof, Employee History, Employee Master List, Check Register, Payroll Journal, Vacation report, 940 & 941 Reports, W2 Forms, & Prints Checks Of course, THE Payroll calculates payroll including Federal & State taxes, prints checks, allows hand written checks, lets user maintain tax tables and keeps an extensive employee payroll history

THE Name & Address System:

- Create name & address files Print mailing labels Sort files by up to 4 items Search or sort by match or range Print a report of a NAD file
- Merge files 88 character open reference field Sort by any character in reference field 10 number zip code

THE Spreadsheet:

- On-line tutorial
 Cut & paste multiple spreadsheets
 Format: Global, Column, Row, Entry
 Arrays: Copy, Replicate, Move, Insert, Delete, Blank
 Labels: centered, right or left justified
 Variable cell width

- Variable cell width
 2 Windows to view separate areas of worksheet
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 Complete glossary of spreadsheet terms
 Maximum spreadsheet size: 255 Rows x 64

- Columns
 Variable print formatting options
 Simple editing functions
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THE Wordprocessor:

- On-line help
 Powerful editing: Erase, Copy or Cut & Paste Powerful editing: Erase, Copy or Cut & Paste characters, words, sentences, lines, paragraphs, pages, or user-defined blocks of text Automatic word wrap-around (may be turned off) User-defined page breaks, soft hyphen, tab, indent and margin settings Proportional & justified printing Global Search & Replace, Automatic & Examine Optional command character viewing Superscript and subscript Phrase files for boilerplate Print bold, centered, underline Edit ASCII files Right or left justification Hyphenation

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as much contrast. It doesn't tilt to as many convenient angles. And you have to pull it off to hook up another monitor.

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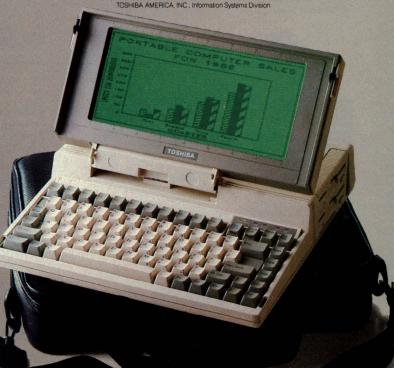
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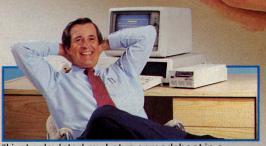
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Software That Advances WordStar

NEWWORD 3 version 3.01 runs on the IBM Personal Computer and compatibles with at least 128k of memory and one disk drive. \$349 retail; Newstar Software, Inc., 3351 Vincent Ave., Pleasant Hill, CA 94523: (415) 930-9400. (For more information, circle 256 on the Free Information Card.)

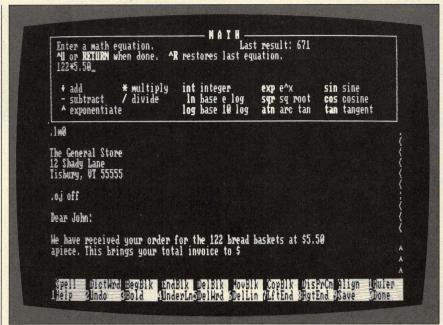
f you're a seasoned WordStar user running NewWord 3 for the first time, you'll feel at home. Both programs use nearly identical commands and menu screens. You can load WordStar documents into NewWord and begin editing immediately. NewWord retails for \$1 less than WordStar, and neither is copy protected.

But, NewWord offers some handy features not in WordStar, including an undo command that can restore inadvertently deleted text, keyboard macros and extensive math capabilities. And NewWord loads entirely into about 300k of RAM, so most users won't have the disk accesses typical of WordStar. NewWord also supports sub-directories (unlike WordStar), so hard disk users can group particular NewWord files together. All this makes NewWord an attractive upgrade for WordStar users who'd like more features but don't want to learn a whole new set of commands. (See the Update section for information on a new version of WordStar.)

For new users unfamiliar with Word-Star, NewWord suffers at times from the same steep learning curve as its mentor. For example, its control keys lack mnemonic clarity.

On a friendlier level, NewWord lets you refashion 20 function keys (10 shifted, 10 unshifted-twice as many as WordStar) and define up to 36 "shorthand" macros (to insert a salutation in a letter, for instance).

NewWord also offers a host of math functions. You'll find these especially helpful if you intersperse figures and text in documents. NewWord's calculator mode, which includes arithmetic and trigonometric functions, lets you



NewWord's calculator mode lets you manipulate numbers while you edit a document.

figure equations as you edit text. Once you get a result, you can insert it in the text with a pair of keystrokes.

NewWord supports block and paragraph addition, too. If you have numerical data arranged in columns, you can mark the column as a block and calculate totals; then block the totals row and show a grand total. Even in non-tabular form, the program can automatically insert a total.

NewWord supports all of WordStar's dot commands that you embed in a file to enhance the printout. But it also adds dot commands that set margins, format a ruler line and produce an index. If you're writing manuals or extensive reports, you'll find this latter feature a boon. With it, you can index words, phrases and numbers by tagging them with a dot command. Alternatively, you can have NewWord index all words in a document, excluding articles and pronouns. NewWord creates an index file with the same name as the document but with an .ipx extension. Here the document's words are cited alphabetically with page references. Numbers are listed in ascending order. You can also create up to 10 tables of contents.

NewWord offers impressive printout

capabilities, too. You can chain files together or merge boilerplate text within a document. And NewWord's merge facility lets you personalize letters or documents by inserting names and addresses (or any information) from a data file into the text. You can even do math calculations on data you merge.

ne disappointment is that New-Word lacks a windowing capability that would let you display and insert selected text from another file. As in WordStar, you have to read in another file entirely, then delete what you don't want; or create an intermediary file. We also would like a printer buffer.

NewWord's substantial documentation covers program operations clearly. It contains sections that address new and advanced users.

In all, NewWord gives an old and respected word processor, WordStar, a run for its money. It maintains most of what WordStar users have become inured to (its command structure) and corrects some WordStar omissions such as macros, math functions and multiple file directories. While it offers no price advantage, it does offer more features.

-Peter E. McKie

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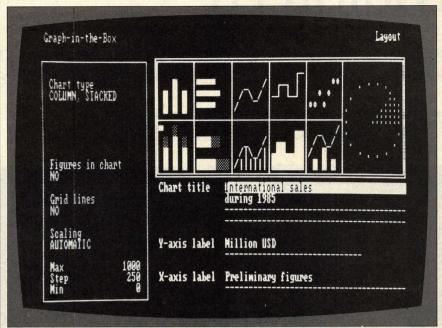
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The layout screen lets you pick the chart type, add titles, and control scaling.

Instant Graphing In Any Program

graph-in-the-box is a RAM-resident program that consumes 128k. You'll need a color or monochrome graphics display board and at least 256k (more to run it with programs with larger memory requirements); \$97.60 (copy-protected), \$140 (non-protected) retail; New England Software, Greenwich Office Park #3, Greenwich, CT 06830; (203) 625-0062. (For more information circle 252 on the Free Information Card.)

espite its name, Graph-In-The-Box is a serious business tool. With it you can quickly turn a table of numbers into a graph, regardless of whether the numbers reside in a word processing file, spreadsheet, data base or almost any other application program. And you can print and save the graph—all without exiting your main application.

While there are a variety of graphing programs available, Graph-In-The-Box is one of the first to take up residence in memory and coexist with your favorite program. Like other RAM-resident programs, such as SideKick and Smart-Notes, Graph-In-The-Box remains hidden until you need it. Once called up, the program acts as if it is integrated with your main application.

Graph-In-The-Box saves you time because you don't have to reenter figures and most labels. Upon completing a report about sales results or comparative costs, for example, you can capture the points for a graph by hitting Alt-G (to bring up Graph-In-The-Box), move the cursor over to the first value or label that begins a range, hit return, use the cursor keys to paint the rest of the range, and hit return again. The information will be copied into a preformatted data grid. A layout menu depicts the 11 graph types available. You can readily change from the default bar graph to an exploded pie chart, if that's what you need. You can add a three-line title to the chart and two-line labels to your X and Y axes.

Since the program drives a variety of printers and plotters, you can then hand someone a quick and not-so-dirty picture of the information you're trying to convey, or save the graph to disk for future use.

While many of Graph-In-The-Box's features are automatic, a sufficient number of manual overrides exist to provide flexibility for more accomplished users. For one thing, you are not limited to capturing data from another program. You can type information directly into the data grid. You can also rotate a vertical column of data into a horizontal plane in the grid—after designating a range of data to capture—by using the F4 key or the Ctrl-S and space bar combination. This is useful in creating a pie chart, which can only handle values from one line.

While the program automatically scales a graph according to maximum and minimum values, you could extend or truncate the results by typing in your own range. This is useful if, for example, you've opted to show figures atop vertical bars and the numbers are bumping into a grid line. Extending a maximum value from, say, 60 to 62 will make the graph less crowded.

A variety of colors and fill patterns (particularly important with monochrome monitors) can be used to define each bar, slice or line of a chart.

Anyone considering Graph-In-The-Box should recognize its limitations. First, once loaded, there's no way to kick it out of RAM short of a warm boot (Ctrl/Alt/Del). So, if you run out of memory while working with an application program, you'll have to save your file, do a warm boot and then reload your application. Some other RAMresident programs have smoother unloading procedures that don't force you to exit your application program. Also, if the number of RAM residents in your system already constitutes a population explosion of sorts, 128k dedicated to graphing could preclude adding more tenants (such as a RAM-resident thesaurus), or opening a large data file kept entirely in RAM.

Y ou are restricted to the length and placement of labels provided in the Graph-In-The-Box format.

Don't plan on graphing a large amount of data in a single chart. The number of variables (columns) times the number of observations (lines) can not exceed 500. Thus, a data grid containing five columns and 100 lines can be controlled, but don't try for 101 lines—you'll get an error message.

Despite its limitations, Graph-In-The-Box is a well-designed tool people can use to turn hard-to-digest figures into easy-to-spot trends and relationships. This kind of power is particularly useful for managers working with figures in a word processor or data base or in a spreadsheet without built-in graphing capabilities. (Some people may even choose to use Graph-In-The-Box with Lotus 1-2-3, despite 1-2-3's graphing facility, in order to take advantage of the program's ease of use and chart variety.) In any case, the greatest benefit of this program is that it gives the user who is not necessarily versed in the intricacies of presentation graphics a way to get a message across quickly and effectively. But watch out—the program is so much fun to work with that you might start graphing every set of numbers in sight.

-Michael Antonoff

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ntroducing a new family of IBM compatible computers that's not new. You've seen and admired Multitech systems for years, the only difference is the name on the front. Until now it was always that of very well known companies.

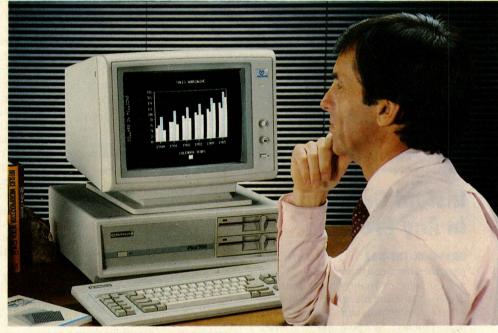
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(For More Information Circle 30)

A Wide-Carriage, Push-Button IBM Proprinter

PROPRINTER XL connects to personal computers compatible with the IBM parallel interface or RS-232C serial interface. It runs at 200 cps in draft mode and 40 cps in near-letter-quality mode; \$799 retail; IBM Corp., 900 King St., Rye Brook, NY 10573; (914) 934-4488. (For more information, circle 253 on the Free Information Card.)

The new Proprinter XL (4202) from IBM is a wide-carriage version of the original Proprinter (4201), with push-button selectable print types. Otherwise, the machine has all the features of the first Proprinter—that is, all its pluses and minuses.

The carriage on the XL was designed to give spreadsheet users the ability to print more columns of numbers than a normal 8.5- by 11-inch sheet of paper can handle. With the wide carriage, you can use cut-sheet or multi-part forms that are up to 16.5 inches wide, or continuous-form paper that is 15 inches wide. With any of these wide paper formats, you can print a line 13.6 inches long. In spreadsheet terms, this means you can comfortably fit 13 columns of numbers (that are 7 characters long) and one column of labels (that are 9 characters long) on a single sheet of paper.

The new operator panel on the front of the XL looks exactly like the operator panel on the original Proprinter, but now you can select print types by pushing combinations of the three push buttons on the panel. If you press the On-

line button while holding down the Line Feed button, you can start to select between 10- or 12-cpi pitch, condensed print, proportional print, emphasized print, double high print and double wide print. The double high print choice is new to the Proprinter. It is included to give users bold characters for speeches and presentations. Some of the selections can be combined; so, for example, you can print both double high and double wide print at once. The one thing to remember is that because these selections are made with the hardware, rather than in software, you can't mix print types on the same page. Ease of selection has its price.

Other new features of the XL include an adjustable left margin guide for cut sheets and envelopes and a lever to adjust the paper rollers to different thicknesses of paper. The capability of adjusting for paper thickness gives you a much better quality of print on multipart forms, envelopes or especially thick paper. The XL also comes with a standard 4k print buffer that can store up to three and a half pages of text. This means you can work on other applications while the XL is printing a document. There also is an optional 8k buffer that can store up to seven additional pages of text.

ow for the features that haven't changed. The XL is still a nine-wire printer. While nine-pin printer heads are more elementary than the now-popular 24-pin heads, the draft mode on the XL produces very clear, easy-to-read print, and the near-letter-quality (NLQ) mode yields print that is extremely good—only occasionally, on those letters with extreme curves in

them, do you get a hint of raggedness. In the draft mode, the XL prints at up to 200 cps; in the NLQ mode, the speed drops to 40 cps. There is also an emphasized print mode, which means the print head passes twice over the same territory and prints at a nominal 100 cps. The actual throughput of the printer is more like 107 cps in draft and 28 cps in NLQ, both rather respectable speeds.

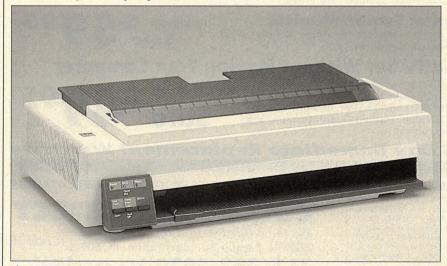
One of the nicest features of the XL and its sibling Proprinter is that you can feed them single sheets of paper through an open slot in the front, without taking out the continuous-form paper rolling through the top of the printers. So, you can quickly print a letter or envelope and return to printing long reports or spreadsheets, without going through the trouble of realigning the holes in continuous-form paper and the nubs on the pin-feed wheels. The XL can be loaded semiautomatically, as well, which helps in lining up very wide paper. By pressing the Line Feed button when there is no paper in the printer, you will start the pin-feed wheels turning. Then all you have to do is catch the nubs in the paper holes as the wheels turn. This saves you from having to line up both sides and at the same time turn the paper advance knob—a difficult feat when you're handling paper that is 15 inches long.

There is a tradeoff for the open-slot feeding feature: noise. Because the noise of the printer's innards can pour through the slot, the Proprinters are quite noisy—something akin to listening to someone go through sheet metal with an electric saw. There is a Quiet mode that you can select on the operator panel, but it only reduces the noise level to 56 decibels from 60 decibels. However, in the Quiet mode, the XL prints even slower (26 cps throughput) than in the NLQ mode.

The fabric ribbon for the Proprinters comes in a snap-in cartridge that is supposed to print up to 3 million characters in draft mode.

The Proprinter XL is a good, quality printer for people who don't need more than a dot matrix printer and have a use for the wide carriage. The operator panel makes most print type selections as easy as pushing a few buttons, and the single-sheet feeding slot is a very nice bonus. If only the noise level and the price were a bit lower, this would be a gem of a printer.

—Henry Fersko-Weiss (More reviews page 123)



The XL is a wide-carriage Proprinter with push-button controls for print types.

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(For More Information Circle 4)

PERFORMANCE

Saving Money With Speedier Communications

High-speed modems cost more than conventional setups, but they can cut phone bills sharply.

by Rick Cook

here are two ways to save money on data communications: Do it less or do it faster. With the growing need for computer-to-computer communications in all sizes of business, communicating less isn't very palatable. Communicating faster, however, is a real option.

For some companies, communicating faster means trading up from 1200-bps (bits per second) to 2400-bps modems; or from 2400 to 9600 bits per second, or using modems that compress data. In a few cases, faster communications means transmitting data at speeds up which translates into 1,800 characters per sec-

to 18,000 bps, which translates into 1,800 characters per second—15 times faster than conventional 1200-bps modems.

For a Jacksonville, Fla., pension plan company, communications savings hit six digits a few months after it invested in 2400-bps modems that effectively transmit at more than twice that speed through data compression. "I estimate that using high-speed modems has cut our communications costs to about one-third of what they were before," says Bob Christiansen, vice-president of operations of Corbel and Co. "For us, that represents around \$35,000 a month in savings."

The company prepares pension plans for attorneys to use for their clients. Because pension plans are complex, a document might be 90 pages long and need to be transmitted error-free.

"Until recently, we worked with 1200-bps modems," Christiansen says. "We like to take advantage of the higher Rick Cook is a free-lance technology writer in Phoenix, Ariz.

Modem Cost: \$250-\$600 **Modem Cost:** \$400-\$900 **Modem Cost:** \$1.500-\$2,000 **Modem Cost:** 2.000-\$2.400

What It Costs

These transmission costs were calculated on the basis of sending ten 20-page documents (3,000 characters to a page) coast to coast every business day for a year.

■ These modems are the most commonly used in business today. As a class, they are not particularly sensitive to noise on the telephone line; but if they encounter noisy conditions, they will try to step back to 300 bps or quit to retransmit—either way, the result will be higher transmission costs.

■ These modems are becoming much more popular in business. They are somewhat more sensitive to noise than the 1200-bps modems, so there may be more dropped connections and, therefore, higher costs. Also, you won't benefit from their speed if they connect to 1200-bps systems.

■ As a class, these modems have the potential for being the most sensitive to noise. How sensitive depends on the choice of components and error-correction scheme. Also, many of these modems can't step back to 1200 bps and so won't connect to remote modems that run at that speed.

■ Because of sophisticated error correction schemes and a lot of on-board computing power, these modems are the least sensitive to noisy telephone lines. They are also capable of stepping back only slightly on the bps rate to offset line problems—and thus run fairly true to the bps rate.

*A throughput rate of 80 percent was used, so that at 1200 bps, for example, the actual transmis sion rate was 960 bps; the throughput rate may vary according to telephone line quality. \$12,222

\$ 6,930

\$ 2,696

\$ 1,638

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speed because these transfers take a good piece of our revenues. With the Microcom modems, our clients are connected for far less time." Now, the time it takes for Corbel to send the documents associated with a pension fund is under 15 minutes, a substantial drop from the hour or so it used to take.

Corbel and Co. has about 60 of the modems installed at its office and in customers' offices around the country.

In communications, the high-speed options divide into two categories. Modems that operate between 4800 and 10,000 bps are really more elaborate, more sophisticated versions of lower-speed modems. Modems from such companies as Racal Vadic, British Telecom, and Concord Data Systems are among the more popular.

The very high-speed modems, which operate at more than 10,000 bps, are considerably different internally. The first popular high-speed modem for

normal dial-up lines, the Telebit Trailblazer (also sold by DCA as IRMA's Fastlink), operated at between 10,000 and 14,000 bps, depending on line quality. The latest version of this modem operates at between 14,000 and 18,000 bps. Another very high-speed modem, the Microcom AX9624C, can operate as fast as 19,200 bps by compressing data being sent at 9600 bps in a 2-to-1 ratio.

Compressing text and numbers can boost bps rates by a factor of two or more.

Like Microcom's modems, the DataRace 9600-bps modem uses data compression. It is actually a 4800-bps modem with a 2-to-1 compression. The Microcom AX2400C modem Corbel and Co. uses is actually a 2400-bps modem, but Christiansen says that thanks to compression the throughput is better than twice the uncompressed rate-570 characters per second versus the normal 240 cps.

It isn't always necessary to buy a high-speed modem to get some of the benefits of high-speed communications. Some communications software, such as Relay Gold, offers built-in data compression, usually about 2-to-1 on a typical file. Thus a 1200bps modem acts like a 2400

and a 2400 can have the equivalent data throughput of a 4800. Compression works very well on spreadsheets and text files.

No matter which option a company chooses, the savings generally come in the form of reduced monthly communications charges. If you can send a data file, a spreadsheet or a sales report in one-eighth or one-sixteenth the time, you can cut your telephone charges proportionately.

aturally, the higher the per-minute charges, the greater the savings. That's a reason that companies with significant overseas data traffic are especially attracted to high-speed is that some 1200-bps modems won't work over international telephone lines,

modems. Another reason which makes linking domestic and international offices more difficult.

That's the problem faced by Verifone, Inc., of Honolulu, Hawaii. The company now uses Telebit modems at 10,000 bits per second to link its headquarters with its plant in Taiwan, an office in Australia and a software development facility in Dallas, Texas. The company makes credit card verification machines in Taiwan and sells them to stores in the United States and other countries.

"We have our entire company tied together by electronic mail with almost no internal paper memos," says James Thompson, the company's vice-president of corporate systems. "The cost of a telephone call to Taiwan during the day is about \$1.43 a minute. We used to use 2400-bits per second modems," he says, "but we had significant problems with errors and the cost of calls. The other offices usually call into our computer here twice a day. With the 2400-

> bps modems, the calls would often last 20 or 30 minutes. Today the call usually lasts five or 10 minutes."

> In spite of the time savings, Thompson says he cannot quantify the cost savings because the company is expanding rapidly and telephone traffic is increasing.

Some users say the highspeed modems have been used to diminish or replace much costlier means of communicating, such as leased data lines, overnight delivery services or private satellite terminals.

For Gearhart Industries of Fort Worth, Texas, the alternative to a \$2,000 high-speed modem is either a \$35,000 private satellite terminal or sending a team of experts into the field.

Gearhart is in the business of oil well logging—lowering instruments into all freshly drilled wells and analyzing the readings to determine if the well should be completed. Since as much as half the cost of a well is in the casing and other operations done after the hole is drilled, and since the drilling crew is standing by at about \$10,000 a day, it is vital to Gearhart's customers that the analysis be done as quickly as is conceivably possible.

Some of Gearhart's com-

Transmission Cost

MODEM	TIME	COST
1 Screen (of Graphics	
1200	2.8 min.	\$ 1.49
2400	1.4 min.	\$ 1.07
9600	.3 min.	\$.65
18,000	.2 min.	\$.65
20 Pages	Of Text	
1200	10.4 min.	\$ 4.85
2400	5.2 min.	\$ 2.75
9600	1.3 min.	\$ 1.07
18,000	.7 min.	\$.65
360k Disk		
1200	62.5 min.	\$26.69
2400	31.3 min.	\$13.67
9600	7.8 min.	\$ 3.59
18,000	4.2 min.	\$ 2.33
1-Megaby	te File	
1200	173.6 min.	\$73.31
2400	86.8 min.	\$36.77
9600	21.7 min.	\$ 9.47
18,000	11.6 min.	\$ 5.27

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petitors use networks of private satellite terminals. "The terminals are about \$35,000 each, and then you need a central earth station," says Jack Burgen, manager of computer sciences for the company. Gearhart still uses the terminals for offshore rigs without telephones. But for oil wells on land, the company now uses Telebit modems attached to personal computers to relay the data back to the central computers for analysis.

Some companies are even looking at the possibility of communicating via modem to cut down on corporate tra-

vel expenditures that are out of hand.

Under a NASA contract, Rockwell
International is developing an experimental communications system based
on personal computers and high-speed
modems, in the hope that travel for
briefings and technical meetings can be

"It's easy to see that when you have to send people across the country to attend a meeting, the expenses for air fare, hotel bills and living on the road, and the cost of people being out of the office all add up to be very expensive," says Chuck Stone, manager of information systems management at Rockwell's space transportation system division.

The system includes still-frame video cameras to capture pictures for transmission, limited image animation and sophisticated conferencing software, as well as high-speed modems. All the pieces are commercially available today. All Rockwell has done is integrate them.

"The key is really the communications link," Stone says. Before highspeed modems, Rockwell had been experimenting with 2400-bps modems on dial-up lines and 9600-bps modems over leased lines. The results were not as promising, because communication was slower.

Against those savings, potential users have to set the costs associated with using high-speed modems. The main capital outlay is the cost of the modems themselves. At a time when a good 1200-bits-per-second modem can be had for \$500, the high-speed varieties cost between \$1,500 and \$3,000.

Almost all high-speed modems use proprietary protocols, so they cannot be used to communicate with modems from other manufacturers or to communicate at high speed with packet-

Payback Period MODEM SYSTEM COST **PAYBACK PERIOD** 1200 \$ 850 2400 \$1,300 1.6 months 9600 \$3,500 5.5 months 18,000 \$4,400 6.9 months The payback period was based on sending one floppy disk

switching networks, such as Tymnet or Telenet. However, most can "step down" to 300, 1200 or 2400 bps.

All other things being equal, the higher cost of high-speed modems makes them prohibitive for very light communications loads. If users don't do a certain minimum amount of data communication, it is cheaper to use a 1200- or 2400-bps modem and pay the higher communications charges.

What that minimum is will vary depending on the cost of dial-up telephone service, either from AT&T or one of the alternate long-distance services such as Sprint or MCI.

here is an upper economic limit as well. Unlike dial-up services, leased lines have a fixed monthly cost, no matter how much they are used. At some point, it becomes cheaper to lease a circuit than to use dial-up services heavily on a rather frequent basis.

Because of the lower limit imposed by the modem cost and the upper limit determined by the time charges for dial-upservices, high-speed modems become most economically feasible in a range of light-to-medium-duty communications requirements.

For some applications, however, economic comparisons based solely on cost per minute are misleading. Generally speaking, a modem's ability to communicate over a noisy line goes down as its speed goes up. But the very high-speed modems (above 10,000 bps) from Telebit/DCA and Microcom are so technically sophisticated they can operate over lines too bad to support even a 1200-bits-per-second link. For users who must work over noisy telephone lines or through old-fashioned switch-

ing systems not designed to support data communications, a very high-speed modem may be justified even for light communications loads.

"The line quality on oil rigs is notorious," says Gearhart's Burgen. "But our experience with these modems is that we generally get through at between 11,000 bps and 12,000 bps. It's good enough that we're beginning to send programs to South America with it."

Figuring the potential cost savings from a high-speed modem is fairly straightforward, but not quite as simple

as it first seems. You can get a rough estimate by dividing your monthly communications charges by the speed increase and determining how long it will take to earn back the cost of the modems in savings in communications.

Assuming that you are using AT&T direct-dial long distance with a cost of 65 cents a minute, it would cost \$4.85 to transmit a 20-page document at 1200 bps (with a throughput of 80 percent) and take almost 10.5 minutes. At 9600 bps, it would take a little over a minute and cost \$1.07. A 360k disk of information would cost \$26.69 to transmit at 1200 bits per second and \$3.59 at 10,000 bps. At 19,200 bits per second, the cost would drop to \$1.91.

High-speed modems generally start at about \$1,500 each for the conventional 4800- and 9600-bits-per-second models. Very high-speed modems run between \$1,800 and \$2,400. Most of the modems come with communications software, so software costs aren't generally a major consideration.

If you had to transmit 320k of information each working day and you used a pair of high-speed modems (19,200 bps) that cost \$2,000 rather than two 1200-baud modems at \$500 each, it would take about 121 working days, or roughly five-and-three-quarter months, to pay back the difference in modem costs with the line savings.

This rough estimate makes no allowance for the effects of excessive line noise, which might reduce the throughput below the expected 80 percent rate. Except for the very high-speed modems, which have more raw processing power than most of the computers they are connected to, high-speed modems are more sensitive to static and other conditions on the telephone line than 1200-bps modems. This translates into more

dropped bits, more time spent retransmitting data and lower data throughput.

In extreme cases, the modem may not be able to hold a connection at all. With some long-distance services, even 1200 bps is difficult between certain parts of the country. And even in cases where the connection will hold, the data throughput slows down considerably. If the line is bad enough, the modem will "fall back" to its next lowest speed. In most cases, this means the speed is cut in half from, say, 9600 to 4800 bps and from there down to 2400 or 1200. This considerably increases data transmission costs. Obviously, if the line will only support 1200 bps, the extra money for 4800 or 9600 bps is wasted.

Very high-speed modems minimize this problem through a combination of sophisticated encoding techniques and more computing horsepower, but even they must fall back if the line is bad enough. One of the other differences between very high-speed modems and ordinary high-speed modems is that the very high-speed units fall back in much smaller increments. Instead of dropping from 9600 to 4800 bits per second in the event of trouble, the Telebit/ DCA and Microcom modems may only fall back a

few hundred bits per second at a time. Since the relationship between modem speed and error rate is not linear, and because it varies depending on the points being connected, it is difficult to estimate how much you should allow for line noise when figuring the effective data rate for payback calculations. It is safe to say, however, that if you have occasional bad blocks at 1200 bits per second you will be likely to have proportionally more of them at 9600 bps.

Until recently, very high-speed communication was available only to companies that leased high-quality data lines or bypassed the phone companies entirely. Bypassing the local telephone company and even the national telephone system entirely is expensive, but is justified where costs are unusually high or the amount of data to be sent

Modems Or Leasing?

MODEMS

LEASED LINE

Initial Cost

Modems that transmit at 9600 bps or higher start at about \$1,500 and can cost as much as \$2,500. And you need one at each end.

Installation fees charged by the local telephone company vary from \$250 to more than \$650. There may also be circuit order or labor fees.

Monthly Cost

Varies with the degree of use and the distance over which you're communicating. Rates are based on the long-distance charges of the telephone company you use.

Fees vary with the local telephone companies, but the cost of a 5-mile leased line ranges from about \$95 to \$175 a month. Long distance lines will add to this amount. But because the costs are independent of transmission volume, very heavy users may find leased lines economical.

Transmission Quality

At 4800 to 9600 bps, the noise on normal telephone lines can significantly reduce throughput, and thereby increase transmission costs. At 18,000 bps, the technology is so good that noise is hardly a factor.

Leased lines offer the best line quality—there is virtually no noise.

Flexibility

High-speed modems will work with any normal phone line and can easily be moved from one office to another. Once installed, the leased line can't be moved without additional cost. And no backup line is available.

through the system is extremely large.

Leased lines aren't as expensive, and they're dedicated to the user who leases them. No matter how much traffic they carry, the cost is fixed. That's why highspeed modems aren't likely to replace leased lines where a lot of data is transmitted. At some point, it becomes cheaper to lease a dedicated line than to use a high-speed modem over regular telephone lines. Just where that point falls varies widely. The costs for leased lines are set partly by the local telephone company and, in the case of interstate lines, partly by the long-distance carrier chosen. The local component is regulated by the state public utility commissions and usually depends on the distance between the user and the nearest switching facility.

The monthly charge for a five-mile-

long leased line varies from under \$100 to close to \$200. This is just for the local component and doesn't include the cost of the additional long-distance leased line that may be required. If the leased line runs to another city or another state, the added cost is usually figured on a permile basis.

In addition to the monthly charge, the local telephone company charges an installation fee, which also can vary with the distance to the switching facility. The installation charges range even more widely than the monthly lease rates. They can be anywhere from about \$150 to nearly \$700. In addition, there may be circuit order and labor charges to contend with.

Taking \$800 a month as a reasonably typical cost for a leased long-distance line, and assuming dial-up charges of 20 cents a minute over the same distance, a user who was hooked into the network more than 66 hours a month would most likely find it worthwhile to switch to a leased line. (This is the situation in principle, even though the calculation does not include the installation charges or amortization of equipment, which might alter slightly the swing point of 66 hours a month.)

Anyone who is comparing the cost of leased lines with

high-speed modems needs to get exact figures on leased line costs from the local telephone company.

Unlike a modem, a leased line is inherently not portable. It runs between two specified points and cannot be moved cheaply. A company representative who travels constantly can't take the data line with him. Getting a leased line installed takes time, usually longer than putting in conventional telephone service. In some places, demand for communications is so heavy it may take weeks or months to get a leased line.

Finally, the cost of leased lines has climbed sharply in the last couple of years. While the cost of the interstate component has been driven down by competition, the cost of the local link has increased as local telephone companies try to make up for the revenue they

Saving Money With Modem Buffers

sing high-speed modems is not the only way to save communications dollars. A new breed of modem devices with memory buffers enables you to send and receive messages or documents when the telephone rates are at their lowest—without being at the personal computer at the time of transmission. In addition to saving money, modem buffers give long-distance communicants a way to get around time zone differences.

The American Bankers Association—a Washington D.C. lobby group—has offices in all 50 states, and often needs to notify these offices about a potential change in the

banking laws so its nationwide constituency can be mobilized into action. Sometimes this notification has to be given before the Western state offices have opened. To solve its communications dilemma, the ABA is just now turning to the time- and money-saving method of using buffered modems. As a pilot project, the ABA has set up seven of its offices with memory-enriched modems that can store messages unattended, even if the remote office's computer is turned off.

On the West Coast, modems in the ABA field offices receive the urgent messages and illuminate a small light on the modem's faceplate.

When the staffers come into the office, that light tells them there is a message waiting for them to read. Staff members turn on the computer, download the electronic message from the modem and either answer it immediately or start in on the lobbying effort required.

When the staff of the Washington office has gone home, the West Coast staffers may tell the modem to send messages in the wee hours of the morning when the telephone rates are lowest. Then, the Washington staffers can read the messages off the modem the very first thing in the morning. This arrangement allows the ABA offices involved to bypass time zones. They are able to get into action much faster and they can pass information back and forth when the telephone rates are down.

How can a modem receive and send messages unattended and without the help of a computer? The answer lies in the technology called "buffering." A buffer is a dedicated block of memory used by the modem to store messages when they are received or until they need to be sent—any time of day or night.

A buffered modem needs more intelligence than the average modem, since it essentially acts like a computer running a communications program. For instance, the Pro-Modem from Prometheus Products of Fremont, Calif., takes a buffer card that adds a microprocessor, up to 512k of memory, a clock/calendar and a communications program on a chip.

As long as the modem is plugged in, it can accept incoming messages and store them in its memory. In a way, a buffered modem is like a computer bulletin board, because users can call it at any time and store messages on it

that are later read by other users at their discretion.

It is also possible to use the memory, processor and clock/calendar so that several messages are sent long after the user has quit working. Through the use of a program provided by Prometheus, the user tells the ProModem to dial some other computers that are set to receive calls. The user can then turn off the computer and go home. At the appointed time, the modem starts dialing telephone numbers and, when it connects to another computer, sends the message or messages at 1200 baud and moves on to the next number to dial. This gives the user great freedom.

"We were using the Telex system," says Don Kazem, business analyst for the ABA, "but you have to interrogate the Telex mailbox in order to find out if you have a message. Using the ProModem, our state chapters know there's a message waiting if the light is on."

Kazem points out that the buffered modems save the ABA money, not only because they can send messages during off hours, but because "if we really had to get an urgent message across, we might have to use Federal Express if it weren't for the modems."

A buffered 512k ProModem is also used at USA Today, where re-

porters across the country send electronic news stories to the Virginia home office for printing. The task of receiving reporters' stories is usually handled by the minicomputer of the paper's Atex text processing system. But "we take the computer down on Saturday, so we let the bureau and staff members transmit to the modem during the four hours of downtime," says Ray Douglas, director of systems for *USA Today*.

Prometheus is not the only modem maker that offers buffered transmission. Hayes Microcomputer Products, Inc., of Norcross, Ga., offers the Transet 1000, a separate buffering unit that can hold up to 512k of memory. The Transet accepts incoming messages unattended, but will not send messages without the use of a computer. The Transet will, however, receive and send electronic messages while the personal computer performs another task.

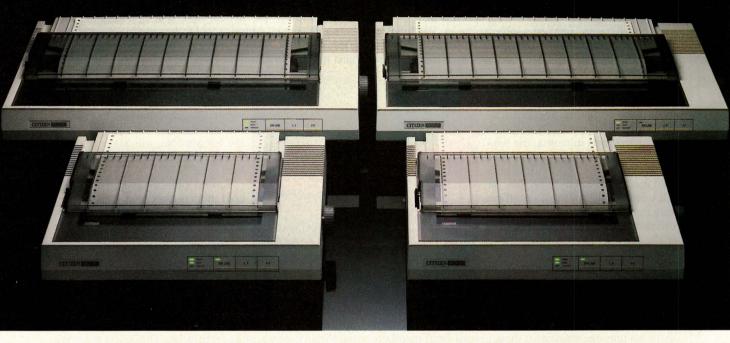
Because the Transet 1000 is independent of the modem, it can be hooked up to a modem of any speed. You could, for example, connect it to the 18,000-bps Trailblazer modem from Telebit Corp. (Cupertino, Calif.) and get non-prime-time telephone rates as well as lightning speed.

A San Francisco company called Visionary Electronics sells a buffered Hayes-compatible modem called the Visionary 1200XT Modem that includes a battery backup in case power is lost while the modem has messages stored in its memory.

The cost of buffered transmission can vary from \$150 for a card to \$550 for a separate buffering unit. But the money you save in transmitting during off hours may well make up that investment.

-Jim Bartimo

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lost as a result of the breakup of the Bell system. Some customers are reporting costs of \$1,300 to \$1,400 a month.

Almost all 300-, 1200- and 2400-bps modems can talk to each other because they use standard protocols and data encoding schemes. Above 2400 bits per second, however, standards range from weak to nonexistent.

There is a standard for 4800- and 9600-bps modems, called V.32. However, the standard hasn't taken hold the

way the standards for slower modems have. Currently, V.32 modems are available from Concord Data Systems and British Telcom. Because there is no firm standard, modems other than the ones following the V.32 standard are all incompatible. A company that wants to use high-speed communications has to be sure that the modems on both ends of a line are from the same manufacturer.

The modems themselves are no harder to use than a conventional modem.

Modems faster

than 2400 bps

use micropro-

cessors that

help them to

work smarter.

Most manufacturers of high-speed modems provide versions of standard communications programs.

Because they are so new, high-speed modems are still finding their place in the business world. The first companies to begin using them were primarily technically oriented firms with specific, costly problems to solve. As the word has spread, companies of all sizes are considering using them to communicate more without spending more.

A Closer Look At BPS And Baud

ontrary to popular belief, "baud" is not the same as "bits per second" (bps), except accidentally. A 1200bit-per-second modem, for instance, actually runs at 600 baud. So does a 2400-bps modem.

The reason for the confusion is that, for a long time, modems that operate at 300 bits per second were the only kind available to personal computer users. It just so happens that a 300-bits-per-second modem is also a 300-baud modem. Many users assumed that "baud" stood for "bits per second" in the same way "hertz" stands for "cycles per second." Unfortunately, it isn't quite as simple as that.

"Baud" is a measure of the maximum number of data symbols, or electronic signals, that can be sent per second over a communications channel. Bits per second measures the information-carrying capacity of the channel. The trick to this situation is that each data symbol can represent more than one bit of information, depending on the transmission method.

A good analogy is a highway full of cars, with each car representing a baud and the passengers representing bits. If you put more passengers in each car, the highway can carry more people an hour.

If your modem is designed to use only two data symbols, then each data symbol can only represent one bit. The reason for this is that a bit must be either a 1 or a 0, since computers record information in binary code. Thus, with two data symbols, you can only send one bit per baud. A 1200bits-per-second modem, which runs at 600 baud, has four data symbols. With four symbols, each symbol can represent two bits (1 0, 0 1,1 1 or 0 0), so the data transmission speed (bits per second) is equal to the symbol transmission speed times the number of bits per symbol ($600 \times 2 =$ 1200). A 2400-bps modem also works at 600 baud, but the "alphabet" of this modem contains 16 data symbols, meaning each data symbol represents four bits.

When the difference is explained in that manner, it doesn't seem like there would be much of a jump from 1200 to 2400 bps, but in fact there was. That's why 2400-bits-persecond modems are less than two years old while 1200-bps modems have been around almost as long as personal computers.

The reason it took so long to advance from 1200- to 2400-bps modems was caused by the difficulty in developing inexpensive circuits that were sensitive enough to distinguish 16 different electronic signals and at the same time screen out noise on the telephone line. The quality of telephone lines is variable. Not only are there problems with noise on the telephone line, but the transmission characteristics of the lines differ with each call and they can even vary from minute to minute during the course of a phone call. To make matters even more complicated, most personal computer modems are full duplex. That means that these modems can send and receive data at the same time. It also means that some of the limited bandwidth has to be allocated to signals in both directions. (The alternative modem design, half duplex, can only send data in one direction at a

time. This design is rarely used today.)

The 1200-bps modems can get by with pre-adjusted filters that will, among other things, amplify certain portions of the bandwidth. This is called "equalization." But the 2400-bps modems can't. They need to adjust to line characteristics continuously and automatically. This kind of "adaptive equalization" requires a microprocessor on the modem.

However, above 2400 bps, adaptive equalization isn't enough. Because it is impractical to increase the data symbol alphabet above 16, the high-speed modems need

ways of increasing the effective bandwidth of the channel to put more cars on the freeway in the analogy. Modem manufacturers employ a variety of methods, but all of them involve using microprocessors to make the modems work smarter, and send more information.

One technique used on several modems involves using the full bandwidth of the telephone line simultaneously in both directions. The modems are talking and listening at the same time. To continue our analogy, this is the equivalent of using all eight lanes on a divided highway in both directions at once. The modems do this by using their microprocessors to electronically filter out their outgoing signal from what they sense on the line. This is called echo cancellation, because a similar technique is used to filter out electronic echoes. Other modems use even more elaborate and complex schemes to make the best possible use of the bandwidth.

Fundamentally, the available bandwidth on a dial-up telephone line is fixed, but the amount of cheap processing power available in modems isn't. By substituting processing power for bandwidth, we can keep increasing the speed of data communications.

-R.C.

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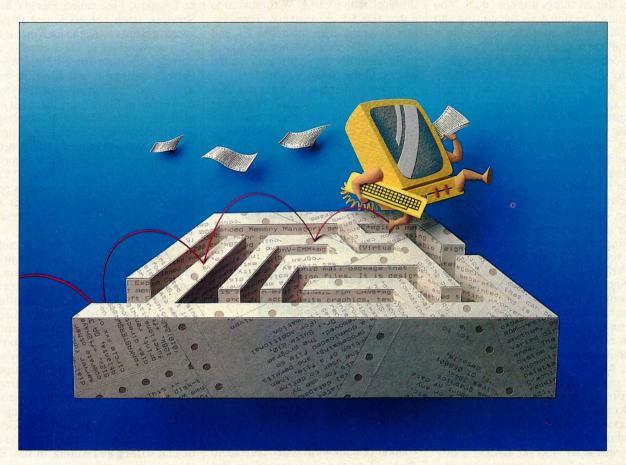
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PRODUCTIVITY



WRITE FASTER

SPEEDIER WAYS TO GET THE WORD OUT

Exploiting underutilized features in a word processing program cuts down the keystrokes and helps get your job done more quickly.

by Christopher O'Malley

riting with a personal computer raises certain expectations. Documents created with an electronic editor implicitly read better, look neater and get finished sooner—just ask anyone in a position to sell you such a program. Of course, people acquainted with personal computers and word processing software know that all of the above don't always happen. In particular, the promise of faster writing and editing can be illusory. Given the opportunity to write and rewrite, to organize and reorganize, you may take longer to produce your documents on the computer than on the typewriter.

"All things being equal, are you getting done faster with word processing than you might with a typewriter?" asks Susan Owens, who heads Word Systems Associates, a

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Pittsburgh, Pa., word processing training and consulting firm. "Sure you are. But all things are not equal. You wouldn't be doing all the editing and adding all the cosmetic touches to a document with a typewriter."

Need you always sacrifice expediency for flexibility and polish? Certainly not. Word processing software *can* help you speed through the writing and editing process, and can do so without sacrificing a thing in readability or appearance. Indeed, for writing tasks with a repetitive element—a name, an address, a phrase, a summary—the features common to word processing software can save you an appreciable amount of time. And there are ways to accelerate your writing at every level of familiarity, from the recent typewriter convert to the veteran processor of prose.

Perhaps the most fundamental timesaving technique in word processing is that of the boilerplate. The term stems from an outmoded method of supplying preset copy to newspapers, but the notion of recycling information to save time is alive and well in the electronic age. Any text that you have reason to use more than once can be boilerplated by simply tucking it away in a file (on disk) and then reloading that file when necessary. One file might contain standard memo headings, another a generic business letter, and vet another a twopage preface for client reports. The process for reusing such text is fast and easy: load the boilerplated copy, make the needed additions or changes (if any), then rename the file so as not to write over the boilerplate file. If your word processor can work with two files simultaneously, a single boilerplate file containing oft-used paragraphs might come in handy, since you can quickly copy text from one file to the other.

You can make writing a letter and addressing the envelope much easier by using boilerplate files. A file called "letter" might be used to store a letterhead, centered and boldfaced. Another file called "envelope" might contain a return address and markers for adding a new name and address—both items formatted to accommodate a business-size envelope. By calling up the boilerplated "letter" and "envelope" files and personalizing them, you can quickly print out the needed correspondence.

WordStar users, for instance, may store their letterhead in a file called "L" and their envelope format and return address in file "E." Upon opening a new file to write a letter, they use Ctrl-K-R to copy in the data stored in file L. Next, they place block markers around the

lines where they type in the name and address of the letter's recipient and copy the block with a Ctrl-K-W command to a new file, E1, for instance. Then, before printing, they open file E1 and copy in file E on top so they don't have to retype either the return address, the address or the envelope format.

Simple boilerplate routines can save you a lot of time and tedium, depending how often you use them and how lengthy the reusable copy is. Still, recycling text in piecemeal fashion may be too slow for handling the frequency or

Your address list needn't rival Publishers Clearing House to take advantage of mail merge.

volume of your form letter correspondence. Here, the "mail merge" or "list merge" capabilities in some word processors put boilerplating in high gear. The mail merge function combines a single form letter with a list of names, addresses, and personalized salutations or phrases to print out many letters at once. Essentially, you leave holes in the text of the form letter with special markers that correspond to information in your mailing list. The mail merge function does the rest, inserting text from your mail list until its collection has been exhausted.

What if you already have a mailing list, but it's in your data base program? No problem—probably. Many data base programs can dish out their data files into standard ASCII text files (or print to disk to achieve the same effect) that then can be read into any word processor and altered with the proper mail list codes. Some word processors can import data base files (usually dBase files) directly.

You needn't have an address list that rivals Publishers Clearing House to take advantage of mail merge functions, either. Even monthly correspondence to a dozen or so people, for example, may be enough to make mail merge worthwhile. Everett Hockenberry, the president of an insurance management firm in Orlando, Fla., called Florida Risk Services, sends contact letters to prospective clients using the mail merge facility in WordPerfect. He does so by importing a file from dBase III into Word-Perfect, creating a text file first with dBase and then using WordPerfect's conversion utility to bring in the list as a mail merge file. Though Hockenberry admits to having no set pattern or timetable for such letters, he says the process is fast enough to accommodate immediate requests for multiple mailings. "You have to go through the conversion procedure every time you update your address list," he says, "but the process is fast-and it works."

Boilerplating has another very useful form: recording the format and print settings of documents for use again in similar documents. Some word processors can store format and print settings with a boilerplated document itself, avoiding the hassle of changing these settings when you move, say, from a memo to a lengthy report. Microsoft Word (for the IBM PC) takes this aspect of boilerplating to its present extreme with a "style sheets" feature that enables you to store and quickly rearrange a complex array of formatting specifics.

Boilerplating, of course, can't do all of your writing and editing for you. But there are ways to hasten these tasks as well. The search for writing and editing shortcuts can begin with nothing more complicated than the "search" and "replace" features common to every word processing program. It's normally a straightforward procedure: search a document for a series of characters or words and then, if you desire, replace that entry with other text. But you can do more than correct repetitive mistakes with search and replace functions.

Putting a temporary identifier or "marker" next to one or more sections of text as you write can make moving through a document, particularly a long document, much quicker. The marker can be any symbol or character combination that's not used elsewhere in the text. For example, you could place "@1" and "@2" and "@3" next to three paragraphs that you need to refer to frequently in writing a report. Using the search function to revert to these marked paragraphs can save you a little time if it's a short report—and a lot of time (and aggravation) if it's a long one. Remember, however, that you have to erase these markers when you're finished writing so they won't be printed with your document.

Three Ways To Save Keystrokes

Chow Down, Inc. 805 Barking Tree Road Andersonville, Ind. 09726 (317) 555-1200

June 18, 1986

George Smith 13 Endicott Place Monsey, N.Y. 10952

Dear Mr. Smith:

You may have been wondering how your entry in the First Annual Name The Dog On Our Box Contest sponsored by Chow Down Dog Food fared. The choice for the judges was a difficult one since many of the names received were ones we'd like to use for our own pets.

Chow Down Dog Food is happy to inform you that you have been awarded fourth place in the Chow Down Dog Food Contest.

You will be receiving a six month supply of Chow Down Dog Food.

Congratulations.

Sincerely,

Iris Pettengill, President

The first paragraph in the sample document has been brought in from a boilerplate file called Intro (see top screen). In the second and third paragraphs, rather than typing out Chow Down Dog Food each time, the abbreviation CD is input. Doing a global search and replace operation substitutes the correct words (second screen). The address is blocked and written to another file that will be used to print an envelope (bottom screen). Though these stroke savers were executed in Word-Star, other word processors can perform similar tricks. Reducing keystrokes as you write is all a matter of technique.

NAME OF STREET OF STREET

June 18, 1986

George Swith 13 Endicott Place Monsey, N.Y. 10952

Dear Mr. Smith:

CD is happy to inform you that you have been awarded fourth place in the CD Contest.

You will be receiving a six month supply of CD.

Congratulations.

Sincerely.

A Read In Paragraph Of Boilerplate

TINDA CHE REPACE HITHE CHON DOWN DOG FOOD

George Swith 13 Endicott Place Monsey, N.Y. 10952

Dear Mr. Swith:

You may have been wondering how your entry in the First Annual Name The Dog On Our Box Contest sponsored by Chow Down Dog Food fared. The choice for the judges was a difficult one since many of the names received were ones we'd like to use for our own pets.

CD is happy to inform you that you have been awarded fourth place in the CD Contest.

You will be receiving a six wonth supply of CD.

▲ Search And Replace Abbreviations

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June 18, 1986

George Swith 13 Endicott Place Monsey, N.Y. 10952

Dear Mr. Smith

You may have been wondering how your entry in the First Annual Name The Dog On Our Box Contest sponsored by Chow Down Dog Food fared. The choice for the judges was a difficult one since many of the names received were ones we'd like to use for our own pets.

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You will be receiving a six month supply of Chow Down Dog Food.

▲ Copy Address In Letter To Envelope

JONATHAN CLYMER

The search and replace feature can cut keystrokes, too. A financial report, for example, might contain the phrase "first quarter profits for 1986" repeatedly. In that case, it is faster to simply key in an abbreviation like "1Q" every time you need the phrase. Then flesh out the text later using the search-andreplace function. Doing this with several repetitive phrases can save a fair amount of time. And this method is not only faster, it is more accurate, as it eliminates possible typing or spelling errors. You need only carefully type in the phrase once; then every such grouping of words will be correct.

Expanding abbreviations with the search-and-replace function has broad appeal—anyone who uses a word processor can do it, and many documents harbor repetitive elements. But you may have an even better facility for conserving keystrokes at your disposal. Many office-strength (and expensive) word processors employ formalized "abbreviation" or "glossary" features. These features enable you to permanently assign a word, phrase, sentence—even an entire paragraph—to an abbreviation of your choosing. When a recorded abbreviation is typed in, you simply hit a special keystroke (like Alt-Backspace) to enter its accompanying text. For example, you could type in "adr" as an abbreviation for a full name and address. Hitting Alt-Backspace (or the appropriate sequence) might then replace "adr" with a five-line address heading.

If your word processing software doesn't sport an abbreviation or glossary function, you can probably supplement it with an auxiliary program that does the same thing. Two examples are: QuickWord for the Macintosh and PRD+ for the IBM PC and compatible computers. QuickWord is a straightforward "desk accessory" program that stores and expands abbreviations. PRD+, from Productivity Software, does the same but expands abbreviations even faster. With the PRD+ program and your list of shortened forms in memory, the program automatically expands abbreviations as it "recognizes" them, using spaces and punctuation symbols to transform groups of characters into words. It's not necessary to add a special keystroke after an abbreviation using PRD+.

A patent attorney, Sheldon Parker, wades through a host of legal and scientific brain-teasers with the help of abbreviations created with PRD+. As director of patents for M & T Chemicals, Inc., a chemical products manufacturer in Rahway, N.J., Parker writes work

contracts and patent applications that are chock full of industry jargon and complex terminology, using WordStar on his Compaq portable. Long chemical names are among Parker's primary candidates for abbreviation; for example, he types in "mbtc" and PRD+ instantly expands it to "Monobutyl Tintrichloride." He also frequently abbreviates part descriptions on patent applications, using the numbers that key these parts on an accompanying drawing. Here, the abbreviation "20" might become "printed board (20)."

In a financial report, you can search and replace '1Q' with 'first quarter profits for the year 1986.'

"It really creates a different style of writing, one that brings the creating time closer to the thinking time," explains Parker." How much time does it save? Parker's own "super-conservative" estimate is that abbreviations have cut his writing time by 50 percent.

Yet another rung up the ladder of automated writing is the macro, a keyboard command that can embody a series of characters and program commands. As with abbreviation features, macro capabilities are found in some richly stocked word processors and can be added to programs that do not include them. Adding an auxiliary macro program to your word processor can bring decided advantages—even if your editor already has a macro function. Typically, the macro features built into word processors are relatively limited, lacking the range of add-on macro programs such as Keyworks, ProKey, SuperKey and SmartKey. These programs reside in memory with your word processor, so their instant access will cost you about 60k bytes of RAM.

Like abbreviation or glossary features, macro commands can quickly insert canned text into a document by permanently assigning text to a particular keystroke (like Alt-H). But a macro

can do much more. It can execute program commands or a combination of text and program commands-anything, normally, that you can enter from the keyboard. This versatility makes creating and using macro commands a more complex venture than abbreviations, but macros can pay off big in time savings. A macro issued with the Alt-B sequence might highlight the word at the cursor position and change its character styling to boldface. An Alt-M macro might open a new document and type in the proper memo headings, including your name and the current date. Alt-P might move quickly to the program's print menu, key in the appropriate format settings and send the document to the printer. These and other macro possibilities can save you a healthy handful of keystrokes and customize a word processor to your liking.

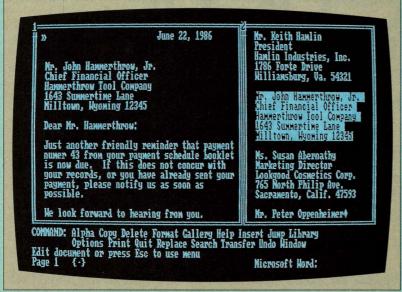
MultiMate's built-in library facility allows you to attach a file of names, addresses and formats, for example, to a particular document. Suppose at some point in your document you want to enter a particular attorney's name and address tabbed 41 columns over to the right. Pressing F5 brings up the library. Entering up to three characters you've previously designated as an abbreviation and hitting the return key tells MultiMate which character string to spell out in the document. At the point where you've left your cursor, you should see "John Smith, Esq., 20 Main Street, Anytown, U.S.A." appear in place. The library facility, however, is not as flexible as add-on macro programs such as Keyworks that are more easily edited and don't have to be attached to a particular document before it can be used.

Keyworks, one of the best macro programs of the lot, is easy to use and has an added dimension: menus. You can quickly create several "pop-up" menus with Keyworks that list your macro names in any order or grouping you specify. Once created, you can call up a menu and use the arrow keys to select which macro you want issued. A series of menus can make your customized macro commands or regular program commands much easier to recall.

Nat Weiner, an attorney in Norwood, Mass., specializing in securities litigation, streamlines his work in preparing legal documents like complaints and depositions by supplementing Word-Perfect with Keyworks menus. Though WordPerfect's abundance of features suit his needs, the program's command structure does not. WordPerfect uses the 10 function keys on the IBM PC and compatibles like Weiner's Leading Edge



Keyworks can create a pop-up menu of macros to quickly insert often-used text.



Copying blocks of text from an address file can speed everyday correspondence.

```
hwg - having
ia - Iowa
id - Idaho
ident - identification
ifast - if we can be of further assistance
ifdo - if there is anything I can do
ifnohr - if we do not hear from you by
ifqs - if you have any questions
ifrsn - if for any reason
il - Illinois
immed - inmediately
incid - incidentally
ind - Indiana
indi - Indiana
indi - Indiana
indi - independent
iney - inevitable
influ - influential
int - interest
interp - interpret
intlg - intelligence
intrr - interfere

PRESS E TO END, (RETURN) TO CONTINUE _
```

PRD + enables you to create abbreviations that expand to words or phrases.

Model M four times each (by themselves and with the Control, Shift and Alt keys) to achieve its 40 basic commands. It's a concise system, but hard to remember. Weiner has tailored a more convenient and faster system using 10 menus to contain these 40 commands plus others. "Remembering 40 different function key combinations in Word-Perfect is a problem for me," he explains. "With Keyworks, I just have to remember, in a general way, what's on my 10 menus."

The net result of his menu system, says Weiner, is that he can spend more time writing and less time groping for the command he needs. "It decreases my need to concentrate on the computer and increases my ability to concentrate on what I'm creating," he notes. "And that's what is important."

hough you may have to dig deep into your word processing manual to find them, there are a variety of other features that can help speed you through otherwise laborious writing and editing chores. Here, one man's esoterica is another man's vital interest. Weiner, for example, would have to spend much more time at the keyboard if it weren't for his discovery that Word-Perfect can automatically number—and renumber-paragraphs. In a legal document like a complaint, he explains, paragraphs often have to be numbered. Manually numbering each paragraph would not be a problem, he notes, but renumbering every paragraph after one is moved or deleted would be a timeconsuming hassle. "Having to renumber hundreds of paragraphs," Weiner says, "might take hours."

There may be many more back-ofthe-manual features in your word processor that can save you time while polishing your work. Many programs can automatically number footnotes and make certain that they appear properly formatted on the correct page. You may have the capability at your fingertips to automatically generate an index or a table of contents by simply marking (with a special symbol or code) the text to be included from a document.

Expanding on your word processing arsenal needn't slow things down. A spelling checker is a must, and many word processors now include one for quick electronic proofreading.

Most of the new thesaurus crop is memory-resident software, so you will not have to wait long for synonyms, and there's at least one outlining program,

Icant, Imwearing magnetic, underwear.

-Computer backup excuse #685

Doing computer backup really gets under people's skin.

They'll do anything to get out of doing it, because backing up is so utterly boring.

But not doing it can definitely be a matter of getting your education at the college of hard knocks.

We're reminded of the PhD candidate in biology who did hunger research for his doctoral thesis without backing it up.

He had data from a year's worth of injecting and weighing rats stored on the disk. The computer crashed, the rat data was erased from memory,

and he had it to do all over.

Back to the rat race.

So do your backup. Floppies if you don't have much memory. Or, if you have 5 to 10 Mbytes or over, on data cartridge – a 3M developed technology whose time has come.

For example, the space-saving 3M DC 2000 data cartridge holds 40 Mbytes of information. You'd need 80 floppies to store that much. And it can fit in your breast pocket.

To read more true-to-life "horror stories" of people who didn't back up, ask your computer products dealer for our leaflet "Horror Stories."

And you can forget about the polarity of your skivvies.

When you run out of excuses."

Ready, that also resides in memory. Benjamin Ziff, a graduate student at the Fletcher School of Law and Diplomacy in Medford, Mass., finds that the popup outline supplied by Ready makes it easier to keep his thoughts on track when writing long research papers with Microsoft Word on his IBM PC. "There are fewer false starts when there is an outline to refer to," says Ziff, "and rearranging the outline is a lot faster than rewriting." Ziff's other timesavers are: automatic footnotes and a mouse. Using the mouse with Word takes some getting used to, he admits, but Ziff says it makes much of his maneuvering and editing dramatically faster than keyboard commands.

Not all of the writing and editing techniques that word processing programs allow are easily mastered. It may take more than a few trial runs before everything appears just so on your form letters, for example, since properly adding codes or markers to the text requires a degree of cleverness and precision. Macros rarely do exactly what you want them to do without some editing. Creating an index of terms or table of contents requires some prior strategy. But while the advanced features in word processing software are not child's play,

they can help you elevate your use of the computer from a correcting typewriter to a powerful writing machine.

You can comb the reference manual of your word processor to point you toward the fast lane of writing and editing, but, given the quasi-English of most manuals, that could take weeks. Common sense and intuition are better guides. Chances are you need only a portion of what the package has to offer, anyway. But even a few gems can save a lot of time, as Nat Weiner attests. "I probably use about 10 or 15 percent of WordPerfect's capabilities," he says. "But even that changes my world."

Speeding Up Your Printing

ait. It's something you have to do every time you send text from the computer to the printer. But just as there are writing, editing and formatting shortcuts that can save you time in creating documents, there are ways to get your files on paper without putting everything else on hold.

Printers are mechanical devices, and therein lies the source of many delays for the personal computer user. Upon your command, the computer sends data—

electronically—from memory or disk storage to the printer. But while the computer can quickly transfer large amounts of data to the printer, the printer isn't always ready to receive it. Most dot matrix and daisywheel printers, for example, can take in less than one page of text at a time. When that small reservoir is filled, the computer waits. Until the computer completes its data delivery, you won't be able to do anything else.

How can you prod your printer into moving faster? Actually, you can't. The rate at which a printer churns, hammers, sprays or beams characters onto a sheet of paper is a constant. Short of buying a faster model, you'll have to live with your printer's speed. But there is a way to circumvent the direct link between computer and printer. The solution is a print buffer, an intermediary reservoir between computer and printer. A print buffer is an electronic storehouse where the computer can quickly dump its data and move on to the tasks at hand. The buffer then transfers the data to the printer—without interrupting you.

Print buffers come in a variety of forms. Nearly every printer has a built-in buffer, if only a small one, and some are expandable. Among the most generous models are Epson's FX-85 and FX-286 dot matrix printers, which each have a built-in print buffer of 8k bytes (about 8,000 characters). Epson offers an internal 32k buffer for these FX printers but, at \$175, it's a rather expensive convenience.



An external print buffer, a small box situated between the computer and printer, can provide the same service for almost any printer. The computer is cabled to the buffer unit, which in turn is cabled to the printer. These buffers usually offer more storage potential (up to 256k) than internal upgrades. But standalone print buffers are also expensive; prices for a 64k print buffer box range from \$150 to \$350.

Printer buffer software can perform the same in-

termediary function at little or no cost. A print buffer program, sometimes called a print spooler, sets aside a portion of your computer's RAM memory for use as a print buffer. You specify how much memory is to be used as a buffer by issuing a command to that effect—usually from within the AUTOEXEC.BAT file so the buffer is established every time you restart the system. Print buffer software is available separately for as little as \$25, but buffer programs are often included with memory expansion boards. AST's Sixpak cards come with such a utility program, for example, as do Intel's Above Board cards. A few programs, like Framework and DisplayWrite, have print buffering built in. The lone tradeoff with software buffers: memory used as a print buffer is memory lost to other programs and data. You may have to give up one of your RAM-resident programs if you are already pushing the 640k limit that DOS can handle.

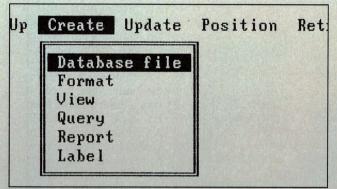
How large a print buffer do you need? Allow about 4k of memory for every full page of text that you want buffered. A buffer as small as 32k may suffice for most day-to-day printing. Remember that buffering works well only when there is a continuous feed of paper, as with tractor and automatic cut sheet feeders. If you manually load single sheets of paper into a daisywheel printer, for example, you will benefit little from a print buffer.

-C.O.

The database used now be used

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anyone can create custom screens. Without programming.

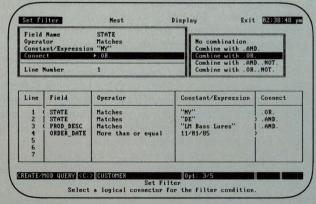
Or using View, access related information in several databases at one time. Without programming.

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by more people can by more people.

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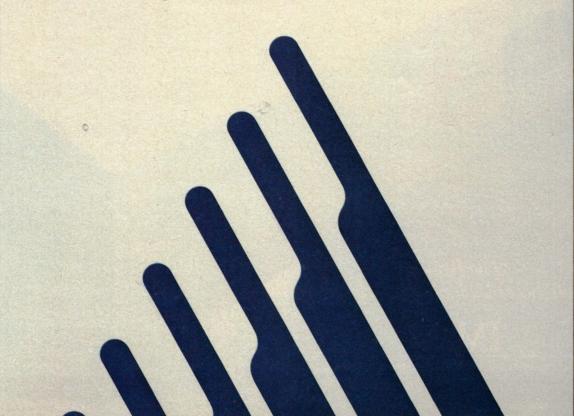
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(For More Information Circle 42)

CORPORATE/BUSINESS

MAKING YOUR SALES FORCE MORE PRODUCTIVE

Helping your staff see computing prowess as a way to increase orders may be your hardest job as sales manager. But you won't have to do it again, once the results come in. by Tom Badgett

he rules for successful selling have hardly changed: satisfy your clients' needs with a useful, competitively priced product and exceptional service, prospect for leads—and do it better than the competition. As a sales manager, you know that if you can vouch for the aforementioned, the rest is academic: the more sales calls your staff makes, the more orders they will get. Simple arithmetic.

Yet, somewhere between giving away the farm in incentives and commissions, and running your sales force as Captain Bligh did the Bounty, are the management techniques that you need to employ in order to have your sales force make more sales calls and make those calls more effective. And if you haven't already figured out that your staff's personal computers are grossly underutilized tools in this quest for sales success, you should take a

Tom Badgett's last CORPORATE/BUSINESS article for this magazine, "Getting A Handle On Your Business," appeared in April 1986.

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tip from Richard Long, regional sales director for Philadelphia Life Insurance Co., in Virginia Beach, Virginia.

"Companies look at computers as an administrative tool," he says. "My approach is to look for marketing applications. The administrative stuff will take care of itself."

In support of his territory's independent insurance sales network, Long goes well beyond the likely sales applications of data base contact files and word processor-generated correspondence. He regularly demonstrates the personal computer's power as a creative sales tool by churning out graphically enhanced newsletters and occasionally running up income tax profiles of prospects. (See related story).

The point irrepressible executives such as Long make clear is that encouraging your sales staff to enlist their personal computers day in and day out—from preparing to make the call to following it up—pays off.

"Our computers have helped the sales staff handle 20 to 50 percent more accounts than they could before," observes Steve Andon, president of TIC Gums, Inc., a New York City importer and wholesaler of water-soluble food gums. Andon's company uses a variety of computer applications, but the core is an extensive data base maintained on an NCR Tower computer that five outside salespeople tap into via modem.

Data base applications to store, organize and generate reports of the facts and figures of your client base are among the most basic for your staff. Since much of the information to be tracked will include meeting and client notes, look for software products that are the most flexible for handling large amounts of text.

For sales staffs, Symantec's Q&A, an integrated data base and word processor, is a worthwhile choice because it is useful for capturing detailed sales call histories; it can merge text and data to produce personalized form letters; report generation is easy; and records are programmable and handle basic math functions well. In addition, Q&A enables virtually anyone to extract data with such questions as:

List any prospects I haven't called in 90 days; or

Show me the purchasing agents and telephone numbers for all companies in Columbus

Easy-to-use filing programs and their companions such as the PFS series, IBM's Assistant series or Q&A are particularly useful when each salesperson is computing independent of a corporate

network, mainframe connection or other headquarters-office support. If your organization can provide custom support, or if you need more sophisticated applications, you should select multiple file packages such as dBase III, R:base 5000 or Paradox. Some of these packages also can support a multiuser application, such as a network, and include programming languages so you can develop custom applications.

ither set up a central data base that the staff can tap into from their individual computers-or else encourage sales staffers to maintain their own customer data base. Either way, having a full store of information on hand is the first and perhaps most important step in preparing for the sales call. Whether the data base is simply an electronic version of index cards or a more complex relational data base system, it will also help make your staff's follow-up process more consistent, and management will have better information for projections and planning.

The data base used by the TIC sales force includes more than 200 pieces of information about each customer: shipto and bill-to addresses, dollar volume this year, a two-year product history, a record of samples supplied, product applications, seven key company contacts, percentage of products used, date of last contact, details on the contact, follow-up date and more.

"We have a screen that shows all of the products that our clients are using. Not only our products, but those of our competition as well," Andon explains. "So before a sales call, we get a list of everyone we know in the company, the products they're using, prices they're paying, what we have quoted, and details on any previous conversations we have had. That eliminates a lot of wasted effort."

There is virtually no limit to the ways your sales staffers can employ their personal computers when it comes to preparing for sales calls. From your own example and with instructive encouragement, you should point out that possibilities range from managing daily appointments and to-do lists to the preparation of sales presentation aids including charts, diagrams and product and market fact sheets. If such applications are new to you or your staff, they will be slow to perfect. But the investment now may well be worthwhile in the long run.

"I'm spending three days a week in



the office preparing to sell, and two days a week actually selling," says Bill Ryan, an independent California distributor of water treatment products who prepares aggressively for each sales call and follow-up using Living Videotext's ThinkTank to outline presentations to salespeople and customers, and to organize information on each client before the call. "But I'm refining the



procedure, and by the end of the year I'll be able to switch the process: two days in preparation and three days selling."

Ryan says he found he was spending too much sales call time talking aimlessly. "I like to talk—without direction. By planning in advance I make better use of my time, I can make more calls in a day, I'm better organized and I make a better presentation."

Part of sales preparation should be interpreting information for the client. Graphics support packages that translate dull or cryptic numerical data into trend-revealing color graphs and charts are worthwhile investments for your sales staff's presentations.

Jennifer Snipes, market research coordinator with WJXT-TV in Jacksonville, Fla., translates rating book data George Rodgers of Beechcraft Aviation
Corp. has to "sell" franchised dealers on
the company's centralized data base.
"We have to show the program is so good
they can't refuse to use it. There are 15
sales problems in the world, but you hear
1,700 iterations. Solve the basic problems
and you have something palatable."

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into graphic form with the help of Chart Master for the air-time sales staff of the television station. "It is much more impressive to a client to show a picture of our market share than a page of numbers. We have set national records for some of the things we do, so our advertising rates are relatively high. We need to show our dominance."

To manage their individual schedules and appointments, you should acquaint your sales staff with any of the many calendar utilities programs such as Borland's SideKick or Deskset from Popular Programs. This type of generalpurpose program stays in memory, even when other programs are running. A simple key sequence displays a menu or application such as a telephone dialer or appointment calendar. When a salesperson is working with a data base or word processing package, he or she can easily check appointments, look up a telephone number-even make the call—make notes, and write a memo or letter without leaving the primary application. When utility programs get to be a habit with sales staffers, they'll be able to log appointments for days, weeks or months at a time without having to search and sort through scraps of loose note paper. If a totable appointment book is more the style of your onthe-go sales staff, Borland now has a Traveling SideKick companion to its original program that provides appointment and phone list printouts for a notebook-size ring binder.

SideKick and other programs that feature screen-capturing capabilities are also valuable for extracting information from one place for use in another. If your sales staff prepares written proposals for clients, they can extract information from the customer file and inventory file for the basic specifications, use a spreadsheet screen for product or price comparisons, and merge this data into an effective pitch document that can be used for face-to-face presentations or sent by mail.

If your staff is equipped with laptop or transportable computers, encourage them to take their computers along on the sales call. There are numerous ways that a confident, expert approach to computing can score points in front of the client—and not merely for showmanship. A telephone link to a central order entry facility can help close the sale by providing instant feedback on prices, quantities in stock, and delivery information. "It is a very formidable weapon for a quick close," says Donn Lewis, with Allegheny Beverage's Desk and Furnishings Division in Cheverly,

Maryland. The Allegheny sales force uses Hewlett-Packard portables to communicate over the Telenet network to the company's host.

It won't always be convenient for your sales staffers to access a telephone line from a client's office, so they should be prepared to download selected information in advance. By having recent client history, including the date of last order and products or services in use, the sales staff avoids calling on someone who just placed a telephone order.

Part of any sales call should be a question and answer period so your sales staff maintains up-to-date facts about clients and prospects. No matter how well designed your customer data base is, it is only as good as the information your sales force feeds it. By establishing some regular procedures for the gathering and input of this information, your staff will learn to maintain the integrity of the data that helps them prospect, prepare for the sales call, and follow up. "We want to know who our competition is, how big a question is financing, how big a concern is the lack of investment tax credit," says George Rodgers, vicepresident of marketing for Beechcraft Aviation Corp., the Wichita, Kan., airplane manufacturer. "By knowing these things, we can put together a national program to address these questions."

er data base provides daily reports to guide your sales team's effort: a list of prospects who haven't been contacted in a specified length of time, prospects by territory, clients who have requested a follow-up visit on this date. For some products, you can keep a record of projected usage so you and the appropriate salespeople will know the right time to call again on a customer for reorders. Entering new information into the customer data base immediately after each call or at the end of the day is an important procedure for any sales staff.

well-designed custom-

Servicing existing clients is a snap if recent sales call information is in your data base. For follow-up letters, make sure your staff is acquainted with the many word processors that will merge mailing lists with a text file to produce personalized correspondence.

"Nobody has more than 20 key accounts," observes Steve Andon of TIC Gums. "But beyond the 20, you have probably another 50 that are really good accounts, and then another 100. No-

body is ever going to forget the major accounts. Where the computer really helps is in managing the second and third level."

Certainly, private secretaries are not feasible for each salesperson; but by providing creative, imaginative computer support, you can help your staff handle their administrative tasks more effectively and efficiently.

For example, one smart way to leverage word processing is to have your sales staff create appropriate thank you or status report "form letters." Each needs to be formatted only once; then, following each sales call, it will be easy for a salesperson to customize the text for individual clients and situations.

Electronic mail services can help here, too. Mail services such as MCI or AT&T Mail can send printed mail to anyone, as long as you can supply a valid postal address. Your staffers will need modems and an E-mail account that costs an average of about \$2 per laser-generated letter. Your staff can just about depend on overnight delivery (or guaranteed overnight or 4-hour delivery for additional charges). Most of these mail services also will keep your letterhead, company logo or individual signatures on file.

Some companies prefer their own electronic mail system for internal use. For a relatively large sales force, you may need several telephone lines attached to a super-microcomputer, but if only a dozen or so people will be accessing the system regularly, a dedicated personal computer and a single telephone line should do. All you need is low-cost bulletin board software to handle the communications for you.

This kind of in-house system helps sales and management personnel stay in touch, share information, and support each other better than by using the telephone or conventional mail.

"Electronic mail has made the entire computer system worth the cost and effort," reports TIC Gum's Andon. "We are in a commodity business, and we need to communicate to our sales force any changes in the marketplace overnight. Or, they will leave a message and say, 'I have this contract and I need you to look at it before tomorrow at 10:00.' They wouldn't get through on the phone, or they would have to leave the message with someone else and that could cause delays."

Andon's company also may take orders over the phone at headquarters rather than insist that clients go through their salesperson. While this procedure gives the client good service, it can cause

A Manager Who Computes The Extra Mile

ichard Long, regional director for Philadelphia Life Insurance Co., in Virginia Beach, Va., is technically an insurance wholesaler who deals varied and complex financial products through a network of 150 independent insurance brokers.

But in his heart, he is an always-on salesman with a deep-rooted sense of customer service and a trio of 512k, modem-equipped sample cases. He admits that his way of selling is the hard way.

"You have to learn a lot about people's needs and interests. Most salespeople sell a policy on what the prospect's obvious interest is—one sale at a time, without getting involved.

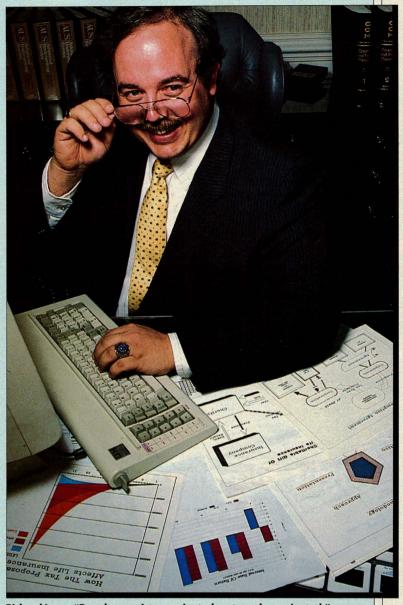
Long's involvement was born from need. Today's insurance business is well beyond the installment plan, term life policy purchase. The brokers that Long serves and supports are today's financial planners to individuals and small businesses. Computations for modern financial vehicles such as individualized whole life policies are too complex for tables and charts. Long employs personal computers as the perfect foil, and teaches his broker retailers to do the same.

One strategy of Long's is to use 1-2-3 spreadsheets as a complement to the company-supplied custom software that is used to demonstrate and calculate a client's insurance profile. In this way, he and the brokers can compare another company's products in a sales pitch. Long uses a similar 1-2-3 template to produce comparisons between an insurance product and other investment alternatives.

Long believes, "There is no way an agent in the insurance business could have done something like that a few years ago. Today we can give the client a more accurate comparison of the purchase choices once we know what the person needs in the financial planning area."

Long shows his agents how to use information in their customer data base more efficiently. "We search information on our individual insurance customers to find out how many employers are represented, who they are, and whether they have a payroll deduction plan for life insurance," Long explains. "Then we can go to the employer and explain that we have conducted a survey and found that their employees may be interested in a payroll deduction plan, or a pension plan or whatever."

Computer-generated correspondence and newsletters for the brokers are powerful tools in Long's arsenal. "I use Chart Master and Diagram Master to produce a wide variety of illustrations." He also trains the brokers to make graphic presentations of flow charts, insurance product relationships and cash-flow projections. "People are picture-



Richard Long: "People are picture-oriented, not number-oriented."

oriented, and what we deal with is so complex it is impossible to get the idea across without them," Long says.

Long depends on a triple-threat series of letters for planned contact and follow-up. Careful use of the data base software helps him track when letters were sent, any response, and when to mail a follow-up. Each succeeding letter mentions the previous correspondence and the client's response, if any.

Long exhibits the patience it takes to lead his brokers through the learning curve. He'll often recommend simple word processors and filer programs to brokers new to computing. Later, as they become more comfortable with these applications, Long will suggest additional, more powerful ones. Philadelphia Life provides custom Lotus 1-2-3 templates for use by sales agents. Long helps the brokers learn to use them, and also writes custom macros and provides audio- or software-based tutorials for brokers who need additional support.

-T.B.



Flight Simulator II Scenery Disks

The Challenge of Accomplished Flight

With a realism comparable to (and in some ways even surpassing) \$100,000 aircraft flight simulators, Flight Simulator II includes full flight instrumentation and avionics, and provides a full-color out-the-window view. Instruments are arranged in the format standard to modern aircraft. All the radios needed for IFR flight are included. Front, rear, left, right, and diagonal views let you look in any direction. Program features are clearly documented in a 96-page Pilot's Operating Handbook.

For training in proper flight techniques, Flight Simulator II includes another 96-page instruction manual, compiled by two professional flight instructors with over 8,000 hours flight time and 12,000 hours of aviation teaching experience. You'll learn correct FAA-recommended flight procedures, from basic aircraft control through instrument approaches. To reward your accomplishments, the manual even includes a section on aerobatic maneuvers.

The Realism and Beauty of Flight

Go sight-seeing over detailed, realistic United States scenery. High-speed graphic drivers provide an animated out-the-window view in either day, dusk, or night flying modes.

Flight Simulator II features over 80 airports in four different scenery areas: New York, Chicago, Seattle, and Los Angeles. Six additional Scenery Disks covering the entire Western half of the United States are now available in IBM and C64/128 disk formats.



Apple and Atari versions will be released soon. Each disk covers a geographical region of the country in detail, and is very reasonably priced.

The Pure Fun of "World War I Ace"

When you think you're ready, you can test your flying skills with the "World War I Ace" aerial battle game. This game sends you on a bombing run over heavily-defended enemy territory. Six enemy fighters will attempt to engage you in combat as soon as war is declared. Your aircraft can carry five bombs, and your machine guns are loaded with 100 rounds of ammunition.

See Your Dealer. Flight Simulator II is available on disk for the Apple II, Atari XL/XE, and Commodore 64/128 computers for \$49.95. Scenery Disks for the C64 and IBM PC (Jet or Microsoft Flight Simulator) are \$19.95 each. A complete Western U.S. Scenery six-disk set is also available for \$99.95. For additional product or ordering information, call (800) 637-4983.

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(For More Information Circle 38)

problems for the salesperson who calls on the customer after the telephone order was placed. "With this electronic mail system, we post all the orders overnight, and each salesperson can look at them first thing in the morning," Andon explains. "If they get embarrassed now, it is for one reason: they didn't turn on their computers."

Bulletin board services are available from the commercial networks, too. MCI Mail, for example, will set up a custom bulletin board for only \$25 per month. With any bulletin board system, you can offer access to your clients as well.

If your sales force is already up and running with a client data base, you might consider adding more functionality with an all-purpose "action" or "to do" routine. By establishing basic fields for project description, due date, project type, action taken, next action, and other data that supports your particular organization, you can design report writers to print meeting agendas, daily to-do lists, project status reports, or appointment schedules. Such routines could be turned over to each salesperson to help with daily schedule management.

With a substantial account history, your staff members can begin using spreadsheet models, or the fa-

cilities of your data base, to predict sales success, or decide how much time to spend on an individual sales call. This kind of information helps them make efficient use of their limited time, and it can offer other benefits.

Steve Andon at TIC Gums uses sales data and Multiplan to forecast longterm sales by product, which results in reduced inventory and lower costs.

"We deal with products that are imported from overseas and need as much as a nine-month lead time. Our computer forecasting was extremely successful. It lowered our inventory and paid for the computer in the first month and a half without having any of our customers see the effect of a lower inventory product base."

Knowing precisely how well your sales force is performing can also be monitored and forecast by you or by individual staffers. You should check up on your staff regularly, and encourage them to do the same for themselves. WJXT-TV's Snipes uses Lotus 1-2-3 to study performance on the entire sales staff. "We do budgeting, forecasting and trending on a quarterly basis. We enter the sales goal for each salesperson and how much they sold; then we can get a

percentage of budget and look at trends over the year."

"We analyze our territories so that, from a management standpoint, we can find out where each salesperson has been making calls," TIC's Andon says. "Are they calling on accounts at the large end of the dollar spectrum, at the low end, or is it a good mix?"

No salesperson is likely to know a customer's business expertly. But to the degree that you and your staff show gen-

'With an electronic mail system, if they get embar-rassed now, it's for one reason: they didn't turn on their computers.'

uine concern and understanding, you can expect a translation to the order blank. Don't overlook your staff's personal computers as research aids.

WJXT-TV, for example, uses a computer data base to build surveys that indicate where people shop and why. After extensive interviews, they can produce customer profile reports for their advertisers that show a store's customer base by age, income or occupation. "Market research is increasingly important for television stations," explains Snipes. "We provide consulting for our clients to help them, and to help us make the sale."

Beechcraft provides their customers with computer-generated travel analysis to show trip costs under various conditions. Obviously, comparative information on cost per seat per mile helps Beechcraft salespeople promote their products, but it also offers customers valuable information they can use in their own businesses. "Cash flow analysis and depreciation schedules very often come up," says Beechcraft's Rodgers, and his company produces these reports for its customers.

When encountering particularly likely insurance purchasers, Philadelphia

Life's Long says: "I might even look at your tax return to find ways to reduce your income tax liability so you would have more money to spend."

Long's company provides Lotus 1-2-3 or Symphony templates, custom programs in VisiCalc and Multiplan, and a variety of vertical market packages for the brokers to do forecasting. Some of these computer tools are distributed from the company headquarters, others are purchased from tradi-

tional retail outlets. And the financial analysis service is usually provided to the customer free, or at a very low cost.

The payoff? "Commissions," reports Long. "And referrals."

Encourage your staff to use the company's centralized data base in different, creative ways, such as exporting some of this information to a spreadsheet or to a chart program to spot trends such as the average length of a sales call, the percentage of success on each call, the average size of a sale, profit, and sales expenses. Most applications packages support conversion of data to forms that can be accessed by spreadsheets or other applications.

The computer is a natural prospecting tool. Have your staff use it to study data from existing clients for new leads or new approaches. Teach

them to apply data base and word processing routines to process leads generated from advertising and telemarketing campaigns.

"I'm amazed at the amount of detail the customer will transmit over the telephone to our telemarketing staff," observes Beechcraft's Rodgers. "They will talk about their company and their family and sometimes get into lengthy conversations." Detailed information at this level is useful to the field sales staff, and also helps analyze Beechcraft's market. How does the company elicit such detailed client information? "We have a highly qualified staff," Rodgers says, "men and women who are qualified pilots and graduate school people. and they just chat with the customer on the phone and through experience ask intelligent questions. The customers don't feel like they are talking to a conventional salesperson."

You can buy targeted mailing lists from a variety of publishers and advertisers. The cost is relatively low, and the contacts can be qualified in advance, to a certain extent, by choosing your source carefully and by specifying types of business, business size, and so on.

Consider using on-line services such

What Can The Number One In Accounting Software DoThat A No. 2 Can't?

Many businesses, fearful of computerizing their accounting, still use pencils to keep their books.

But what those businesses really should fear are pencils.

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problem areas. Our easy-to-use Open for Business*package is so full-featured it'll do just that; obviously, a pencil won't.

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as CompuServe for communications, market research and prospecting that will support your field sales personnel. CompuServe's EasyPlex electronic mail service lets you send a message to any other single subscriber free. Or you can set up a mailing list and send messages to a number of subscribers for 10 cents each. You can access demographic information to find out the average resident age in communities by ZIP code, or the average home cost and income by age group. These reports are \$10 each and could be valuable to insurance, investment, or any direct sales effort where income information is helpful.

This on-line service is easy to learn and use and, when used wisely, its price (\$6.50 per hour) makes it a veritable bargain as a sales and marketing aid. You will need a modem (300 or 1200 baud), communications software for your computer and an account with the service. If you are new to using on-line services, start with some well-planned projects based in the headquarters office and after a month or two, determine if the results justify the cost. If so, you can then move on to broader use of the service, perhaps even setting up individual sales representatives with access to these information sources.

Think about having your staffers go on-line with the computer communica-

tions facilities of existing or prospective client companies. Larger companies frequently provide access to in-house bulletin board and messaging services. These companies buy a wide range of products and services and are interested in contact with many suppliers.

ike some other large corporations, 3M maintains an impressive news and bulletin board service. The 3M Newsroom is an on-line service that offers company news and background information, speeches from company officials, and message services.

This service also includes a vendor-only section where companies that sell to 3M can get the latest information on company needs and directions.

If anyone on your staff sells to any federal agency, then membership in ITT Dialcom, an international packetswitching network and mail service, may be well worth the service's modest cost. Virtually every federal agency provides daily updates to a federal news and information data base via Dialcom facilities. Your sales staff can search this vast information storehouse by agency, topic, date, and other criteria, to look for trends, project announcements, and personnel information.

Too many sales organizations stop short of using their personal computers for all but the obvious. It is perhaps the sales manager's toughest job to help the field staff understand and tap the capabilities at their disposal.

"We find we can't use a whip and chair technique to force computer use," says Beechcraft's Rodgers. "We have to show these people that the program we have to offer is so good that they can't refuse to use it."

That was difficult for Beechcraft to do, at first, because the company does all its business through franchised retailers. "They are not our employees, so we have to sell them on the concept of what we are trying to do," Rodgers says. A central data base for sales leads, performance, and follow-up tracking is available to Beechcraft Airplane sales reps through a telephone link.

But these franchise operators, on the other hand, are concerned with protecting their leads and business autonomy, so they are slow to share information with the factory. "We operate on an award basis, not a punitive basis," Rodgers explains. "There are probably 15 sales problems in the whole world, but you hear 1,700 iterations of them. Solve those basic problems, and you have something that is relatively palatable," he advises.

Tips For The Enterprising Salesperson

Keep meaningful records. Use data base software to help you keep track of customer information, trigger follow-ups, and produce analytical reports. Experienced salespeople who use computers aggressively report a 20 to 50 percent productivity improvement from data base use alone.

Get maximum mileage from your data. Look for new ways to use the information you collect and the applications software you have. Your data base on sales calls, for example, may help you realize a relationship between time spent with a client and sales results. Or, data that you run through specialized software may show revealing trends when viewed with a spreadsheet or graphics package.

Go graphic. Enhance presentations, correspondence and reports with charts. Everyone is more receptive to numerical or comparative data in graphics form. Charting and drawing software is reasonably priced and easy to use.

Follow up. Write more personal letters with computer word processing software. In this age of heavy telephone use and photocopied forms, people respond favorably to personalized letters. If you're still using a typewriter, you can improve productivity three to five times with a personal computer for word processing.

Communicate. Your personal computer is a potential window to the world. Use it to send bulletin board messages to colleagues and clients. Take advantage of the best electron-

ic mail services. Research your prospects and markets—even your competition—with on-line services.

Get Organized. Utility programs that offer calendar functions, note-taking and telephone-list dialing capabilities may be just the thing for your harried work pace.

Close the sale. Don't limit your computing expertise to preparation and follow-up; when possible, take the computer along on the sales call. On-the-spot analysis, information gathering and order checking can do more than impress your clients—it may convince them.

Go beyond the obvious. There is a widespread tendency to become comfortable with one or two applications. This limits the effectiveness of your computer system and reduces your chances for exceptional sales success. Learn as much about each application you employ as possible; don't be hesitant to use additional software as you need it.

Pay attention to detail. One of the wry jokes in business is "It was a computer error." Computer errors ultimately translate to people errors, and that will reflect you in the worst light. For example, a word processing error that addresses letters to one person and makes the salutation to someone else makes you look unprofessional and careless. Proofread everything you send out to make sure it is as complete and professional as you can make it.

-T.B.

Breaking Away Some executions of the sure of the sure

ou may be one of those people who still believes that medicine has to taste bad, and that computer simulations are just games for people who don't have anything important to do.

If so, make way for a new point of view. Top executives in all types of businesses break away from their high-pressure jobs to become, if only for an hour or two, Allied submarine captains sluicing through the Pacific Ocean on the way to sink surface-born enemy

ships, chief executive officers guiding companies public in the face of fierce competition and an unstable money market, and heads of state negotiating their way toward or away from the devastation of global thermonuclear war.

For most of the workday, these executives are the deal makers whose critical business decisions directly affect the financial health of their companies. But simulations provide an escape from the confines and frustrations of the executive suite, and let executives explore a world in which they control their own destiny with impunity. Competitive and goal-oriented, these power brokers find it relaxing to confront winning and losing in a no-risk environment.

Virtually all executives find that simulations provide a level of realism that piques and maintains their interest; but beyond that, the payoff of simulations varies. Some in-

dividuals use simulations strictly as a break from work. Others use them to hone skills. Still others use simulations as teaching tools, and others learn something they can take back to their jobs. But no matter what type of simulation they choose, executives walk away from their favorite simulations refreshed—and better equipped for whatever business they pursue.

As the director of purchasing for Omaha Steaks International, Bruce Simon handles all the company's expenditures, from buying beef to paper clips. When he needs a break, Simon challenges cutthroat competitors in Business Simulator.

Some high-level business executives relieve the pressure of the boardroom by immersing themselves in simulations—detailed recreations of real-life situations that can relax and reward at the same time.

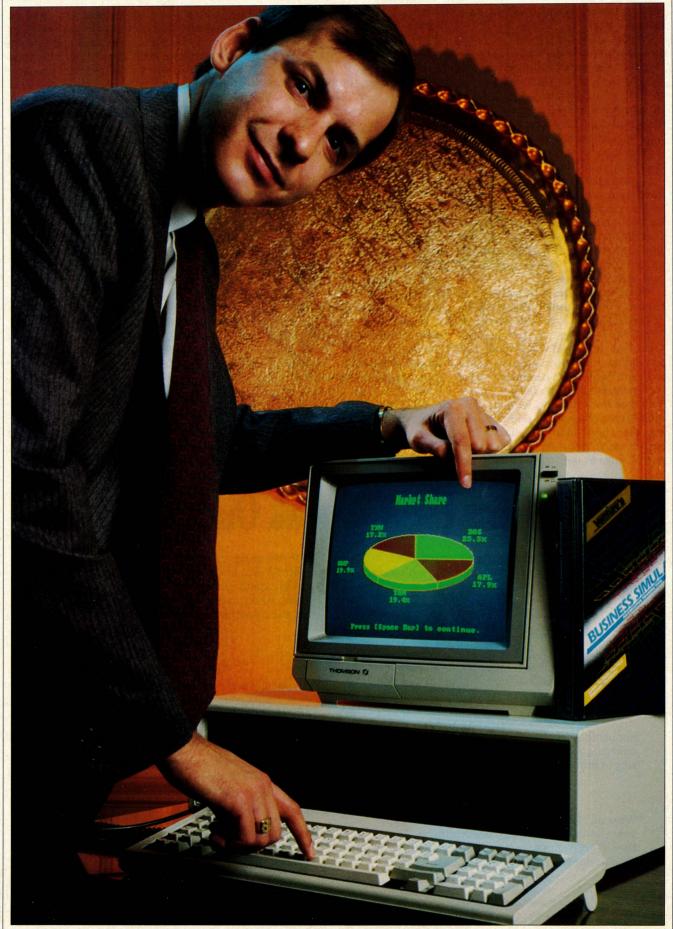
by Denise Caruso

Philip Slayton is one executive who uses a simulation purely for relaxation. Slayton, president and CEO of Heritage Properties in Santa Barbara, Calif., spends part of his day strafing enemy planes in an F-15 fighter jet over Haiphong, and the rest of it making mega-dollar real estate deals—all from the comfort of his office.

As a real estate developer, general contractor and broker, Slayton buys historical houses in Santa Barbara County, especially those designed by architect Frank Lloyd Wright, and then renovates and resells them. He also takes the time to use the F-15 Strike Eagle simulation in his office at least once each day. "Games and the other things I do to relax are the things that I can bury myself in mentally. What they do is close down those other tracks of my mind," Slayton says. "I get involved in some very serious business problems, some of which could mean millions of dollars if they're not handled correctly. But if I climb into a simulation, it all goes away."

Slayton was a Navy carrier-based fighter pilot in Vietnam, and he says the only difference between F-15 and actually being there "is that I don't have the noise of the engines and the sound of my navigator

Denise Caruso is a San Francisco-based free-lance author of technical and general-interest articles on computing.



ROGER RESSMEYER

whimpering in my ear about what I was doing wrong."

Slayton avidly pursues his F-15 fantasies. He says his marketing director was "ready to slit my throat once" because he used the F-15 simulation so much it took Slayton two days to pull a list of investors out of the computer. And Slayton bought his company six Hewlett-Packard Vectras instead of an HP 3000 minicomputer because the Vectras could run simulations.

Slayton's dedication is apparent. "We have word processing here, and 1-2-3 and a complete accounting package," Slayton explains. "But the first software I bought and ran was F-15. And the first time I played it, I missed two business appointments and one hot date, just missed them entirely."

While Slayton flies the skies to relieve tension, Harold Castner, vice-president of investment for American Express in Nashville, Tenn., takes to the water with Gato. Gato is a World War II submarine simulation in which you receive orders from the Pacific fleet commander as to the whereabouts of the Japanese navy. You then track the navy with the sub's radar and periscope. In addition, you can use a grid map that shows land masses and the location of your sub and enemy ships as they move in real time.

Your sub's control panel includes indicators for fuel, battery life, oxygen, water depth, number of torpedoes and other necessary statistics.

m probably a peculiar case," says Castner of his attachment to Gato. "In the late 1950s, the taxpayers spent a lot of money teaching me to operate a submarine like the one in the game." Castner trained on a vintage World War II submarine—almost identical to the one in Gato, he says—at the U.S. Navy Submarine School in New London, Connecticut. "It was a lot of fun," Castner says. "When I saw a submarine simulation, I thought, 'Hell, I have to have it whether it's good or not.' But it's a remarkable simulation."

Castner keeps Gato in his office and plays it at least once a week, usually in the late afternoon. The biggest benefit he gets from the simulation is relaxation. "You get completely absorbed and have a good time," Castner says.

While Slayton and Castner use simulations to relax, other executives combine a simulation's pleasure with using it to hone their skills. David Dempsey, a vice-president for New York-based

Prudential-Bache Securities and a small-plane pilot, uses Flight Simulator to break away from work and to keep his flying skills up to snuff. At work, Dempsey helps finance and structure the merger and acquisition of financial institutions by Prudential-Bache clients. Dempsey calls his "a crazy business" that keeps him working around the clock for days or weeks at a time.

Because Dempsey's schedule frequently prevents him from enjoying his hobby, he sometimes slips into the cockpit of Flight Simulator's Cessna 181 and "flies" with the help of his Compaq transportable. "Flight Simulator provides a totally different dimension to what I'm doing from a work standpoint," Dempsey says. "My work requires me to be indoors a lot of the time, meeting with people and working long hours. [Flight Simulator] takes me away from all that craziness. I love flying, and this is an easy way for me to go flying."

Flight Simulator operates in real time and gives you a view from inside the cockpit of a single-engine plane. It displays all the plane's instruments on a control panel along the bottom half of the screen, and you operate the controls from the keyboard. The simulator also re-creates the runways of 80 airports throughout the country. "I wouldn't de-

Simulations Users Speak Out

"Simulations are kind of like 'gym for the mind.'
You drain off excess intellectual energy—it's a kind of conquering, like getting in an extra mile."

—Jim Burger, Balance of Power user Partner McCamish, Ingram, Martin, Brown & McCullough law firm

"We deal in a pretty high-pressure environment with lots of deadlines. For us, spending 15 minutes in a simulation is like spending two hours in a book."

-Tom Allen, Gato user Architect Brian Smith and Associates

"Simulations take you to a different world, just like seeing a good movie, providing the phone doesn't ring to bring you back to the real world."

-Clive Shearer, Gato user Advertising consultant Concepts in Communications

"What do I like about simulations? It's that coldsweat-on-the-back-of-the-neck syndrome. That's hard to get from a computer, but with some of these simulations you really build up some suspense."

> -Scott Dingwell, Fokker Triplane user Associate Pacific Century Group

"The two sports simulations I have, baseball and football, are almost like playing—without getting out there and running around, working up a big sweat. And you don't have a whole crowd of people out there watching you mess up."

—Sheldon Guyer, Micro League Baseball and NFL Challenge user Assistant vice-president Merrill Lynch Futures Inc.

"It's addictive. If you have a free evening, you can't stop. Unlike most games, it's always just as spellbinding as it ever was."

> -Bill MacLaren, Balance of Power user Independent defense consultant

"Matching wits and strategy is just as real in a simulation as it is in real life."

-Arthur Wernicke, Bank President user Vice-president Citicorp International Consumer Group

"What I like about simulations is you become so damned involved with them. They provide a fantastical escape."

 Philip Slayton, F-15 Strike Eagle user President and CEO Heritage Properties



In addition to enjoying Flight Simulator, Prudential-Bache Securities VP David Dempsey hones his instrument flying skills.

scribe Flight Simulator as a game, because I don't see it as a game," says Dempsey. "It's fun, but it does require some skill and some thought."

As a pilot, Dempsey says the program "pretty realistically re-creates the performance of the plane itself." This detail not only adds to Dempsey's enjoyment, it also helps him in a concrete way, to stay current on instrument flying. "You can try instrument approaches and landings in heavy clouds and wind without ever leaving your apartment." Dempsey says. "This is the closest you can get, living in New York City, to going outdoors without actually going outdoors."

For Robert Derenthal, simulations give him more than simple enjoyment, too. He has served for 15 years as senior vice-president for Community Psychiatric Centers in Santa Ana, Calif., supervising the administration of 24 U.S. hospitals and four hospitals in Great Britain, in addition to dialysis and

home health care centers. Derenthal is also a simulation nut, and he regularly plays Millionaire and Tycoon—simulations of the stock and commodities markets, respectively.

espite the fact that he's been in management positions for more than 20 years, Derenthal says he's still learning, and not just from life. He gives some credit to simulations as well. "For example," Derenthal says, "I have a fairly sizable amount of investments in the stock market. Commodities frighten me to death in the real world, but the simulations are realistic enough to challenge my intellect, and I have fun and learn from them."

By consistently using the stock and commodities simulators, Derenthal has widened his scope of the financial market as a whole. "My analytical skills have improved—one, because I have more practice at it; and two, I avoid the trap so many people fall into of finding simple answers or stereotypes. They think that one aspect of a thing controls the situation. You need to learn that so many different variables determine the outcome, so you get more in the habit of trying to look for all those variables."

Bruce Simon, too, feels that a simulation can teach users a lot about the simulation's real-life counterpart. That's why he uses Business Simulator, a program that puts you behind the president's desk of a start-up company that could go public and become a multinational corporation. Simon is the director of purchasing for Omaha Steaks International in Omaha, Neb., a family-owned business that employs 300 people. The company buys boxed beef, processes it into portion-controlled steaks and markets it via mail order, food-service chains and distributors.

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"I find Business Simulator interesting because of the realism and the decision-making processes you have to go through," says Simon. "It's one thing to play a game, and it's another thing to go through the mental process you have to go through to run a business."

The program makes you the head of a start-up firm, where you encounter all the headaches and heady successes that are a part of the business world—including actions your competitors take against you and vice versa (like priceslashing or getting out a new product first), changes in the money market, increasing manufacturing capacity, the effects of advertising and the way the business and financial press receive your product. An important feature is the program's "pro forma" capability, which lets you test different actions before actually committing yourself to one.

Business Simulator's realistic detail makes it a valuable teaching tool for Simon. "I'll give it to marketing managers who don't have strong financial backgrounds, even though they have qualities that make them an asset to the company," says Simon. "It's good because it has analysis and tutorial modes.

And when they play it, they'll either get creamed or win—but the bottom line is that they're learning something, and that's important." Simon also used Business Simulator to teach a group of ninth-grade Junior Achievers the detail of how a business works. "I needed a toy to snag their interest for 45 minutes a week," he says.

ut when Simon uses the simulation himself, the program-and Simontakes on another dimension. Simon delights in developing a strategy that will put the screws to his competitors in the unreal world. "I try to get the net worth of my company over \$1 billion," he says. "One time I remember, my own personal net worth was God knows how many million, and everyone else was limping along at less than a hundred thou. I also try to do things like get my gross margin up, get more market share and get my products on-line before the next guy. I haven't managed it yet, but I'm also trying to go private instead of public. So far I've only gotten my personal share of the company up to about 35 percent but that's what makes it fun. It's like playing Space Invaders," Simon explains. "It gets boring unless you put in a new twist."

Simon says the program "absolutely" sharpens his business skills and intuition, but it also gives him free rein in an environment in which he's normally limited. "In my case, it's a family business, and the decisions I make affect everyone in the family," he says. "I can go out and do anything I want with the program. But my uncle is the head of marketing, and in real life, if I want to do anything, I have to ask him first."

Like Simon, other simulation buffs choose a simulation closely related to the type of work they do, and they come away from the simulation more knowledgeable. These people bring real-life skills to a simulation in earnest.

Bill MacLaren, a major general retired from the U.S. Air Force, represents one such user. MacLaren currently works as a defense consultant to the United States and other western governments, NATO, and U.S. and European industries.

How Simulations And Games Differ

t's easy to pinpoint the similarities between simulations and games: Both let you escape to another world, to win or lose; and both engage the eye and the mind. Clearly defining the differences between the two is a little harder, though.

People involved in simulations feel that three factors distinguish simulations from games. First is the level of detail the simulation provides. Peter Markulis, a professor of management at the State University of New York in Genesco, studies management simulations. "Simulations are an attempt to model the real world," he says. "To simulate is to get a flavor for a real decision-making situation. A game would be something where there's more chance, more luck [involved]."

Bob Slapin, president of Blue Chip Software, a simulations manufacturer, concurs: "[A simulation] is a model of reality," he says. As models of real life, Slapin adds, simulations "deal with different consequences. In games, sometimes you get to act in a somewhat realistic environment, but you don't get realistic consequences."

Related to this detail is the second distinction between a simulation and games: simulations require a more complex set of reactions from the user, one that involves intuitive responses and experience. Philip Adam, executive vice-president of Spectrum Holobyte, manufacturer of Gato, sees the difference as the degree to which the user has to rely on these attributes. "I associate 'game' with 'arcade game,' and shoot-'em-up situations," says Adam. "Simulations are different—they're much more of a

decision-making tool as well as a game. In a plain game, people win with the quickest reaction time. But simulation people are the ones who think."

Adam admits there is a crossover between the two. "But the 'thinking person' distinction really specifies what we believe is the difference," he says. "We try to throw in the fast action [of a game], but in reality it's a combination of a tiny bit of that and a lot of real-life decision-making. A simulation is competitive and it challenges the mind."

Markulis feels that the premise on which games and simulations are based makes up a third differentiation. "Rules are part of the distinction," says Markulis. "A game is a pretend reality. A game is just some arbitrary rules set for win or lose. You play to win, and there is usually a winlose outcome. In a simulation, it's not necessarily a winlose situation. The purpose is different—to model what goes on in the real world.

"Is Monopoly a simulation? You'd have to stretch it to say it's a simulation. It's a game because the rules are so unlike the real world—they model reality only in a sense, but they're too unlike reality. You still make decisions based on the throw of the dice or the turn of the card."

Perhaps an associate of Markulis's sums up the differences best. Markulis says, "Daniel R. Strang, a colleague of mine, was in my office with a clever phrase he'd found somewhere. It was, 'Simulations emphasize the detail of the real world. Games suppress the detail of the real world.'

-D.C.



Jim Dalton, a 20-year veteran of the futures and securities markets, picks up some market intricacies with Speculator.

The only simulation he uses regularly is Balance of Power, where, as president of the United States or general secretary of the U.S.S.R., you make policy decisions to increase your country's economic and political prestige with other nations, without angering your enemies and starting a thermonuclear war.

The program covers familiar turf for MacLaren. "It's not that far away from life for me. I know the guys who actually make the decisions in those countries."

The program has taught the general a thing or two about his work. MacLaren believes Balance of Power lets him "back off and hover at the ceiling" to see what is really going on in a given diplomatic situation. It also makes him less triggerhappy. "It really does," he says. "It's kind of seductive, the way it goes about doing that. The thing [Balance of Power] continues to bring home to me is, 'Don't be impatient'," he says. "It's also good for honing my advisory skills," he says. "If you don't get a glimmer of understanding of how things relate to the power structures in the world, the game is always a total disaster."

MacLaren is impressed with the way the program details a country's problems, resources and spheres of influence, especially Third World countries. "I think by accident, because this wasn't one of my goals, I learned a lot more about some countries that I thought I knew reasonably well," MacLaren says.

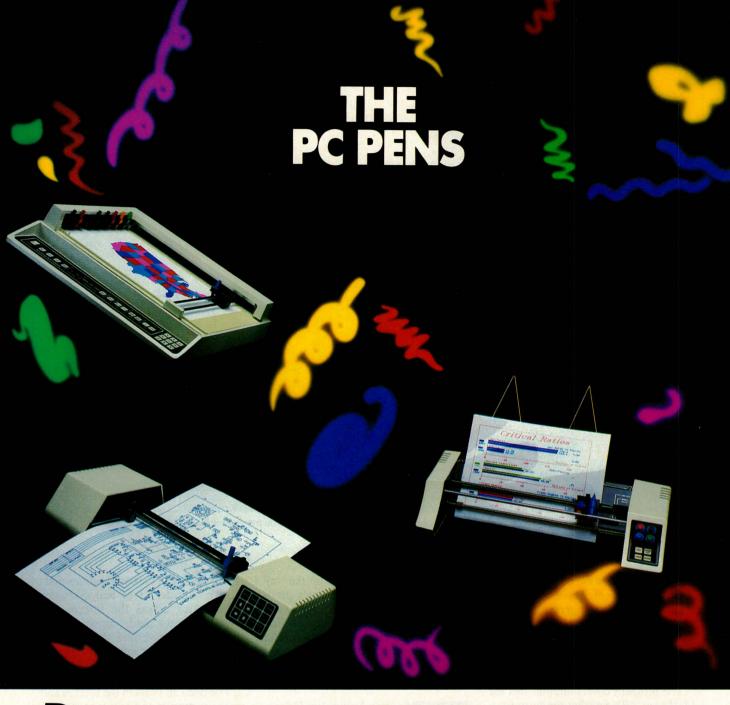
utures broker Jim Dalton, owner of the discount brokerage firm J.F. Dalton Associates in Chicago, Ill., discovered the educational aspects of simulations for himself when he used a commodities market simulation called Speculator. In it, you start as a novice trader with \$10,000, a speculator with \$20,000 or a floor trader with \$40,000. The object is to double your equity within the program's 45-day time frame.

Dalton says he found the program to be "as close to real as you can get. It's very educational." Speculator uses bona fide historical information from 45 days of trading in the commodities market. The "trader" sees real exchange tapes ticking across the screen, real news headlines and, among other things, can observe how the prices of bonds, currency and gold and silver affect commodities prices—"one of its powerful aspects," according to Dalton.

"I've been 20 years in the futures and securities market and in this game, you find out how weak your skills really are," Dalton admits ruefully. "I did not make money playing this game. You always think you can master the markets, and every time [Speculator] reinforces that it's a lot more difficult than you thought. For someone to use it right, they'd have to put time into learning the strategies. If they do that, and then come in to seriously buy and sell, it could be of tremendous value."

Arthur Wernicke, a vice-president at Citicorp's International Consumer Group in New York City, supports the bank's growing consumer lending programs in Europe and the Middle East, Africa and Latin America. He finds Bank President particularly helpful in

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giving him an overview of his work.

"When you work for a very large bank such as Citicorp, only the chairman or senior executives are running the entire bank," says Wernicke. "With Bank President, you match wits with the computer, or your competitor, in running an entire operation yourself—you don't get that opportunity very often. It's stimulating, a real-world thing. The way the program reacts is exactly the way the market reacts to bank earnings. It is very applicable to my job."

Wernicke is certain that Bank President has improved his decision-making skills. "In the real world, if you're making decisions, they don't come back for weeks or months or years. If you're lending aggressively, it could be a long time before the returns come back. But in this game, you see the results of your decisions very early." That helps him learn from those decisions.

n fact, Citicorp bank was so impressed with Bank President that it retained the developer to tailor a version of the simulation for them, using Citicorp's own financial statements and information. This will enable a branch in each country in which Citicorp does business to create a model based on its own social and economic factors, inflation rates, and so on, instead of constantly modifying U.S. data.

At the bottom line, simulations give executives an environment in which they can relax, without the pressure to make the right decisions. And that's enough for some executives. For others, simulations provide an extra dimension, one where the simulation's realism teaches them something and so enhances its value. Derenthal of Community Psychiatric Centers believes that simulations provide executives with "a more sophisticated way of winning with skill and achieving something, the challenge of making decisions. Simulations can be entertaining because you can make all kinds of decisions knowing that you aren't going to get fired over them. At work, you can't say, 'I don't know if this is a good decision or not, but I'm going to gamble.' But you aren't going to lie awake at night worrying about a decision you make in a simulation."

On the other hand, Castner of American Express holds no noble visions of simulations. He keeps things in perspective. "I don't have any compulsion to [use simulations] all the time, but it really is refreshing to say, 'To hell with it! Let's go sink ships."

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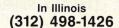
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ANSI Spec Product: These are "okay" diskettes. They have a clipping level of 40%. Usually they are the fall-out from a manufacturer's "high-clip" product line. You can expect about 1 out 20 to fail in normal use.

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failure rate of ANSI product is 50,000 times higher!

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Well, I wish we had more space, but we don't.

we don't.

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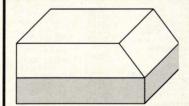
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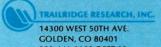
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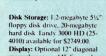
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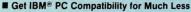


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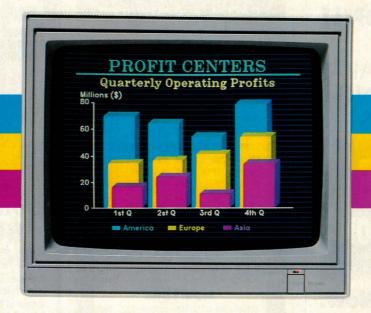
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(For More Information Circle 33)

EGA BOARDS AND MONITORS

by Patrick Honan

hen it came to the type of display possible from your computer, you once had to sacrifice color in order to get sharp text. Otherwise, characters would be fuzzy. Monochrome, unfortunately, meant that you had to give up the additional impact that could be conveyed with color—colorcontrasting varied trends on a chart, for example. But now, enhanced graphics

adapter boards and high-resolution monitors that work with these boards have combined the best aspects of both monochrome and

color display.

The EGA board and monitor work hand-in-hand. The board determines the pixel resolution, which is the number of dots displayed horizontally and vertically on the screen. The higher the resolution, the more defined the characters are on the screen. All EGA boards provide a pixel resolution of 640 by 350. The board also determines the number of colors that will be displayed on the monitor. The monitor affects the clarity and quality of the signal it receives from the EGA card.

The 640- by 350-pixel resolution of EGA boards approaches the 720- by 350-pixel resolution of MDA (Monochrome Display

Adapter) boards and surpasses the 640 by 200 resolution offered by CGA (Color Graphics Adapter) boards. All EGA boards have RAM that determines the number of colors that are displayed at one time. This RAM is used solely for the display and cannot be used to increase the memory on the computer. Most EGA boards have 256k bytes of RAM, which permits 16 colors to be displayed from a selection of 64. Some boards, which include IBM's Enhanced

Graphics Adapter, come standard with 64k but can be upgraded to offer 128k or 256k of RAM. You'll pay a little less for 64k or 128k of video RAM, but will sacrifice much of the color and quality you purchased the board for in the first place. Boards with 64k display only four colors. Boards with 128k display 16 colors, as do boards with 256k, but they lack the smooth scrolling and added screen

memory that 256k of video RAM provides. The extra screen memory enables the board to switch more quickly from one screen display to another. CGA boards enable you to select four colors from a palette of 16.

Recently, another entry was added to this alphabet soup of display boards: the PGC (Professional Graphics Controller). The PGC offers a 640- by 480-pixel resolution and enables the user to display 256 colors out of a total of 4.096.

Presently, PGC display is much more expensive than EGA. Expect to pay about \$4,000 for a PGC board and compatible monitor as compared to under \$1,000 for an EGA board and monitor.

Although not as sharp as PGC display, EGA still offers excellent display quality. Add to this the vast price difference and the growing selection of EGA boards and monitors, and EGA is the definite choice

over PGC for all applications except professional design.

EGA boards generally emulate MDA and CGA boards, allowing you to use a monochrome or CGA-compatible monitor and software that doesn't have drivers for EGA display. Some boards emulate the monochrome graphics standard of the Hercules board from Hercules Computer Technology. Check what display modes most of your software works with. Do this by checking the manual, asking the company or testing it on an EGA board.

EGA boards handle the emulation of different modes in several different ways. Some boards use DIP switches that you have to set when changing modes. Make sure the DIP switches can be reached from the panel at the rear of the computer. Otherwise, you'll have

to remove the cover to reach the switches each time you want to change display modes. Other boards come with software that enables you to switch modes through keyboard commands. Generally, this is easier than having to deal with DIP switches, but try boards that offer each method. That's the only sure way of knowing which method suits you best.

Some EGA boards come with a parallel port or light pen port. Tecmar's EGA Master offers an optional serial port.

LARRY CARRO

BUYERS GUIDE/EGA Boards And Monitors

These boards are generally \$25 to \$50 more expensive than the comparable board without the port. If you need these ports, look for an EGA board that has them; it's less expensive than purchasing a second add-on board and they will give you a free slot in your computer. If you don't need the ports or foresee a use for them, then don't clutter your computer with unnecessary options.

EGA boards come in half or full sizes. Both perform equally well. Your choice

is determined by how many full and half slots you have open on your computer and what added ports you want. (The boards with ports are usually full-size).

You may want to keep a step ahead of evolving technology by selecting an EGA board that includes two RCA jacks and a "features" connector. IBM put this connector on its EGA board but never announced an intended use for it. Other manufacturers have put them on their boards as a contingency. One possible connection might be to another device that would capture still images off a videocassette recorder, for example, and then display and manipulate the image on the monitor.

Look at what other features the boards have. For instance, VEGA from Video 7 has a "screen saver" feature that shuts off the display if nothing

has been typed for a predetermined period of time. This will prolong the life of the monitor if you have a habit of leaving it unattended with an image brightly burning into the tube. The EVA Board from Tseng Labs enables you to magnify a section of the display.

EGA-compatible monitor to complete it.

Choosing an EGA board is only half the picture. You must also select an

What makes a monitor EGA-compatible? Video output, whether it be monochrome, CGA or EGA, is sent to the computer at a certain horizontal scan frequency. For EGA, the horizontal scan frequency is approximately 21.85 MHz. An EGA-compatible monitor has the ability to "tune into" the 21.85-MHz scan frequency and therefore display the signals being sent from the board. Since all EGA monitors are also CGA compatible, they can also tune into the 15.75-MHz frequency. In this way, monitors are like television sets, which are tuned into different broadcasting frequencies. Two monitors, the MultiSync from NEC Home Electronics USA and the CPD-

1302 from Sony, are compatible with

the scan frequency generated by PGC boards.

There are a number of comparisons to make in shopping for a monitor. Look at the dot pitch, bandwidth, pixel resolution, and above all, the quality of the display. Comparing specifications will give you a handle on the relative merits of the monitors, but the only true test is which monitor has the display that is most pleasing to your eyes.

The dot pitch is measured in millime-

EGA boards and monitors that work with these boards combine the best aspects of both monochrome and color display.

ters and refers to the amount of space between the dots, or pixels. A smaller dot pitch means there is less space between the pixels and therefore the display is sharper. Most EGA-compatible monitors have a dot pitch of .31mm, although several have smaller dot pitches.

The bandwidth, measured in megahertz, is the rate at which the monitor's beam turns on and off when putting an image on the screen. The higher the bandwidth, the quicker the beam turns on and off. The result is a sharper picture, although there may be only a slight difference that the eye can notice between monitors with different bandwidths.

Many EGA-compatible monitors are capable of a greater pixel resolution than 640 by 350 but are locked into that figure by the EGA board. All compatible monitors display at least the 640 by 350 resolution, so this is really not an important criteria in comparing monitors. The Multisync and CPD-1302, the two EGAcompatible monitors that work with PGC boards, will display the PGC's maximum resolution of 640 by 480 pixels.

Above all else, look at the display. Re-

action to color can be very subjective. Run a variety of programs-both textand graphics-based. If possible, use the same computer and EGA board you plan to use with the monitor. Does the picture remain clear and sharp toward the edges of the screen? Is there flickering or blurring when scrolling? Examine characters closely to see how sharply defined they are. Experiment with the brightness and contrast controls to see which monitor can best be set at the intensity you prefer.

Most monitors come with nonglare screens, and a handful come with tilt/swivel stands. Use the monitor in a variety of different lighting conditions to see which screen does the best job of deflect-

ing glare.

Most EGA-compatible monitors have a diagonal screen size of 12 or 13 inches. Three in our charts have a 19-inch display, but these are decidedly more expensive than the monitors with a smaller screen size. The least expensive of the 19-inch lot, the CS/ 19 from Computer Systems, is priced at \$1,290.

Check to see where the on/off switch, vertical and horizontal controls, and brightness and contrast, are located. The most convenient location is along the front of

the monitor. This enables you to easily view the screen while adjusting the controls. Switches are easier to adjust when they're not recessed. Recessed controls are set back into the monitor and can only be turned by using a screwdriver.

Look for a monitor that has a text switch if you plan to spend a good deal of time working with a word processor, spreadsheet or other text-intensive application. This switch enables you to move from a color display to green or amber characters. Some monitors offer other colors, but green and amber are the most popular, and are considered the easiest on the eyes. Try out the text switch to see if the colors meet with your approval. Sometimes an advertised amber color will really be closer to yellow.

Find out if the monitor comes with the cable to connect it to your computer. You don't want to have the monitor sitting on your desk with no quick and easy

way to attach it.

Unlike memory or storage space, a monitor is not something you can upgrade. Short of replacing it, you are locked into the color and text quality it provides. Stare long and hard at a variety of screens before settling on one.

A GUIDE TO EGA BOARDS The products listed below are EGA boards. The Emulation column refers to the display modes in addition to EGA that the board provides. The column on the location of DIP switches refers to the switches needed to change emulation modes and does not refer to switches that control a parallel port, clock/calendar or other accessory.

COMPANY/Product	PRICE	VIDEO RAM (K)	CARD SIZE	POSITION OF DIP SWITCHES	JACKS AND CONNECTOR	EMULATION AND SPECIAL FEATURES	
American Mitac Corp. MEGA	\$399	256	F	R	Y	Emulates CGA, MDA and Hercules. Includes parallel and light pen ports.	
AST Research AST-3G	\$450 (64k), \$525 (256k)	64 or 256	F	R	Υ	Emulates MDA. Parallel port (\$25) available. Includes diagnostic software.	
AST Research AST-3G Plus	\$500 (64k), \$575 (256k)	64 or 256	F	R	Y	Emulates CGA, MDA and Hercules graphics. Permits switching between modes without using software. Other features same as AST-3G.	
Atronics International, Inc. MegaGraph	\$499	256	Н	R	Y	Emulates CGA and MDA. Hercules emulation (\$50) optional.	
ATSys Corp. ATSys EGA-Plus	\$495	256	F	R	Y	Emulates CGA and MDA.	
Everex Systems, Inc. Enhanced Evergraphic Plus	\$599	256	F	NA	Y	Board can drive monitors in EGA and Hercules modes at once. Switching be- tween modes is done through software Includes parallel port.	
Everex Systems, Inc. Enhancer	\$399	256	F	NA	Y	Includes parallel port.	
Genoa Systems Corp. Spectra-EGA	\$599	256	F	NA	Y	Emulates CGA and MDA. Includes par- allel port. Emulation changes are done through keyboard commands.	
IBM Corp. Enhanced Graphics Adapter	\$524	64	F	R	Y	Emulates CGA and MDA. Video RAM may be expanded to 128k (\$199) or 256k (\$259).	
IBS Corp. EG256	\$495	256	F	B	Y	Emulates CGA and MDA. Includes por allel port and light pen port. User car switch between two display modes through included software.	
Orchid Technology Orchid EGA	\$595	256	F	NA	Y	Emulates CGA, MDA and Hercules graphics. Switching between modes done through software.	
Orchid Technology TurboEGA	\$945	256	f	NA	Y	Emulates CGA, MDA and Hercules graphics. Includes a turbo card featur that makes PC and XT run faster thar AT. Switching between modes done through software.	
Paradise Systems Paradise EGA	\$599	256	Н	R	Y	Emulates CGA, MDA and Hercules graphics.	
PC Designs, Inc. PC Designs EGA	\$299	256	Н	R	Υ	Emulates CGA and MDA.	
PC Designs, Inc. PC Designs EGAPlus	\$325	256	Н	R	Y	Emulates CGA, MDA and Hercules graphics.	
PC's Limited EGAds	\$269	256	F	R	Y	Emulates CGA and MDA. Includes light pen and parallel ports.	
Persyst EG-8	\$595	256	F	R	Y	Emulates CGA, MDA and Hercules. In- cludes serial and parallel ports, clock/ calendar, RAM disk and print spooler.	
Quadram QuadEGA+	\$595	256	H or F	R	Y	Emulates CGA, Hercules graphics, MDA and monochrome graphics.	
Qubie Distributing EGA Card	\$349	256	F	R	Υ	Emulates CGA and MDA. Includes par- allel port.	
Sigma Designs, Inc. SigmaEGA	\$595	256	Н	R	Y	Emulates CGA, MDA and Hercules graphics.	
STB Systems EGA Plus	\$595	256	F	В	(connector only)	Emulates CGA and MDA. Includes utilit software with print buffer and RAM disk. Includes parallel and light pen ports. Clock/calendar (\$29.95).	
Tatung Co. of America TEGA-22	\$599	256	Н	R	Y	Emulates CGA, MDA and Hercules graphics. Includes light pen port.	
Tecmar, Inc. EGA Master	\$395	256	F	R	Y	Emulates CGA and MDA. Serial port (\$50) optional.	

CGA-Color Graphics Adapter; F-full-size; H-half-size; k-kilobytes; Mb-megabytes; MDA-Monochrome Display Adapter; N-no; NA-not applicable; Y-yes; B-located on board. Not reachable from rear of computer; R-reachable from rear of computer.

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This is the Tatung CM1380... a 13"RrGgBbl Super High Resolution monitor. It features a 64 color display with 640 x 350 lines of resolution; 22KHz/15KHz dual frequency.





(For More Information Circle 67)

EGA BOARDS

COMPANY/Product	PRICE	VIDEO RAM (K)	CARD SIZE	POSITION OF DIP SWITCHES	JACKS AND CONNECTOR	EMULATION AND SPECIAL FEATURES
Tseng Labs EVA Board	\$525	256	F	NA	Υ	Emulates CGA and Hercules (optional) Features 132-column text display and ability to zoom in on section of screen. Software controls emulation switching. Includes parallel port.
Video 7 VEGA	\$595	256	Н	R	Y	Emulates CGA, MDA and Hercules graphics.
Vutek Systems, Inc. MF-EGA Board	\$895	256	F	R	Y	Emulates CGA, MDA and IBM mono- chrome graphics. Includes parallel and serial ports, clock/calendar (XT model only), RAM disk and print spooler.
Vutek Systems Vutek EGA	\$595	256	F	R	Y	Emulates CGA, MDA and IBM mono- chrome graphics.

CGA-Color Graphics Adapter; F-full-size; H-half-size; k-kilobytes; Mb-megabytes; MDA-Monochrome Display Adapter; N-no; NA-not applicable; Y-yes; B-located on board. Not reachable from rear of computer; R-reachable from rear of computer.

A GUIDE TO EGA-COMPATIBLE MONITORS The products listed below are EGA-compatible monitors. The Color column refers to text switch colors. Unless noted, the cable is included. C-1350 from Panasonic and CPD-1302 from Sony are expected later this summer. The pixel resolution listed refers to the monitor's maximum resolution.

COMPANY/Product	PRICE	SCREEN SIZE (in.)	DOT PITCH (mm)	BAND WIDTH (MHz)	PIXEL RESOLUTION	WEIGHT (lbs.)	TEXT SWITCH	COLOR	SPECIAL FEATURES
Amdek Corp. Color 722	\$799	13	.31	22	720×350	32	Y	W,A,G	Has non-glare screen.
American Mitac Corp. Mitac MEGA-1	\$699	14	.31	14	720×350	29	Y	A	Has non-glare screen.
Aydin Controls Patriot Enhancer	\$2,700	19	.31	25	640×350	75	N		Has non-glare screen.
C. Itoh Electronics, Inc CM-4000	\$800	13	.31	20	640×350	26.4	Y	G	Has non-glare screen.
Computer Systems CS/9	\$450	9	.31	20	650×350	12	N		
Computer Systems CS/13	\$590	13	.24	25	750×350	25	Y	W	
Computer Systems CS/19	\$1,290	19	.24	25	750×350	50	N		
Conrac Corp. Model 7064	\$735	14	.31	23	640×350	25	Υ	G	Has non-glare screen.
Electrohome Ltd. ECM 1311	\$1,195	13	.31	30	720×540	30	N		Has non-glare screen.
Hitachi Sales Corp. of America CM1455S	\$799	13	.31	20	720×348	32	Υ	A	Has non-glare screen.
IBM Corp. Enhanced Color Display	\$849	13	.31	16	640×350	22	N		Has non-glare screen.
MicroTouch Systems, Inc. Enhanced Touch	\$1,945	13	.31	25	640×350	28	Y	G	Has touch screen.
NEC Home Electronics USA Multisync	\$799	13	.31	30	800×560	31	Y	G, Y, W, LB, DB, R, B	Comes with tilt/ swivel and non- glare screen. PGA compatible
Panasonic Industrial Co. C-1350	\$699	13	.39	25	640×350	24	N	ATMOO SA	Has non-glare screen.
PDS Video Technology EGA-19	\$2,295	19	.31	30	1,000×800	88	N		Cable (\$50) not included.
Princeton Graphic Systems HX-9E	\$750	9	.28	20	640×350	25	Y	A, G	Has non-glare screen and tilt/swivel stand.
Princeton Graphic Systems HX-12E	\$785	12	.28	20	770×350	30	N		Comes with time ed non-glare screen. Option text screen.

A-amber; B-brown; CGA-Color Graphics Adapter; DB-dark blue; G-green; in.-inches; LB-light blue; lbs.-pounds; MHz-megahertz; mm-millimeter; N-no; PGC-Professional Graphics Controller; R-red; W-white; Y-yes; YL-yellow.

PERSONAL COMPUTING / JULY 1986

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Model SC-300P

RGB Super High Resolution, 13" non-glare screen, .31mm dot pitch, 640 dots x 400 lines, 16 colors. Designed to support STB Super Res 400 graphics board, Emulex B.O.B. Board, Sigma 400 (L), and other comparable color graphics boards. FCC Class B.

EGA PERFORMER

Super RGB High Resolution, 13" non-glare screen, 640 dots x 350 lines. Displays up to 64 colors. Designed to support IBM Enhanced Graphics Adapter, IBM Color Graphics Adapter, and compatibles. Dual scanning frequencies 15.7/21.8KHz. Text switch. FCC Class B.



Model SA-1500

High Resolution Monochrome Amber 12", Non-glare screen. TTL/IBM compatible. Resolution: Center 800 dots; Corner 750 dots. FCC Class B.



Model SG-1500

High Resolution Monochrome Green 12", Non-glare screen. TTL/IBM compatible. Resolution: Center 800 dots; Corner 750 dots. FCC Class B.



Model SC-150

Composite/RGB High Resolution 13"
.42mm stripe pitch. 640 dots x 200
lines RGB; 320 dots x 200 lines
composite. With audio and green
text switch. FCC Class B.

Also available:

Model SC-100 Composite Color Monitor Model SC-200 RGB Color Monitor Model SA-1000 and Model SG-1000 Composite Monochrome Monitors Complete line of dot matrix printers.



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(For More Information Circle 63)

"IBM, Enhanced Graphics Adapter are trademarks of the International Business Machines, Inc.; Super Res 400 is a trademark of STB Systems, Inc.; BO.B. Board is a trademark of Emulex Corp.; Sigma 400 is a trademark of Sigma Design, Inc.

EGA-COMPATIBLE MONITORS

COMPANY/Product	PRICE	SCREEN SIZE (in.)	DOT PITCH (mm)	BAND WIDTH (MHz)	PIXEL RESOLUTION	WEIGHT (lbs.)	SWITCH	COLOR	SPECIAL FEATURES
Quadram Corp. Quadchrome Enhanced Display	\$795	13	.31	18	640x350	31	Y	A, G	Comes with tilt/ swivel stand.
Qubie Distributing HR31350	\$499	14	.31	16	640×350	35	N		Has non-glare screen.
Quimax Systems, Inc. PX22	\$699	13	.31	25	720×350	35	Y	A	Has non-glare screen and tilt/ swivel stand.
Sakata USA Corp. EGA Performer	\$799	13	.31	20	640×350	31	Y	G	Has non-glare screen.
Samsung Electronics, America CD1452 M	\$450	14	.31	23	640×350	26.4	Y	G	Has non-glare screen.
Sony CPD-1302	\$900	13	.25	25	900x560	25	N		PGC compatible Has non-glare screen. Can dis- play 110 charac ters by 60 lines.
Tatung Corp. of America, Inc. CM-1380	\$849	13	.31	20	640×350	25	Y	A, G	Has non-glare screen.
Thomson Consumer Products CM 363111D	\$750	14	.31	20	720×350	27	Y	G	Has non-glare screen.
TTX Group TTX 1222	\$695	12	.31	23	640×350	25	N		Has non-glare screen.
Wyse Technology WY-640 EGA Monitor	not avail.	14	.21	25	640×350	37	Y	A, G	Has non-glare screen and tilt/ swivel stand.

A-amber; B-brown; CGA-Color Graphics Adapter; DB-dark blue; G-green; in.-inches; LB-light blue; lbs.-pounds; MHz-megahertz; mm-millimeter; N-no; PGC-Professional Graphics Controller; R-red; W-white; Y-yes; YL-yellow.

EGA BOARD AND MONITOR COMPANIES

Amdek Corp.; 2201 Lively Blvd., Elk Grove Village, IL 60007; (312) 364-1180 (For more information, circle 271)

American Mitac Corp.; 3385 Viso St., Santa Clara, CA 95054; (408) 988-0258 (For information, circle 272)

AST Research, Inc.; 2121 Alton Ave., Irvine, CA 92714; (714) 863-1333 (For more information, circle 273)

Atronics International, Inc.; 491 Valley Way, Milpitas, CA 95035; (408) 943-6629 (For more information, circle 274)

ATSys Corp.; 320 Elm St., Marlboro, MA 01752; (617) 481-6009 (For more information, circle 275)

Aydin Controls; 414 Commerce Drive, Fort Washington, PA 19034; (215) 542-7800 (For more information, circle 276)

C. Itoh Electronics, Inc.; 5301 Beethoven St., Los Angeles. CA 90066; (213) 306-6700 (For more information, circle 277)

Computer Systems; 26401 Harper Ave., St. Clair Shores, MI 48081; (313) 779-8700 (For more information, circle 278)

Conrac Corp.; 600 N. Rimsdale Ave., Covina, CA 91772; (818) 966-3511 (For more information, circle

Electrohome, Ltd.; 809 Wellington St. N., Kitchener, Ontario, Canada N2G 4J6 (519) 744-7111 (For more information, circle 280)

Everex Systems, Inc.; 48431 Milmont Drive, Fremont, CA 94539; (415) 498-1111 (For more information, circle 281) Genoa Systems Corp.; 73 E. Trimble Road, San Jose, CA 95131; (408) 945-9720 (For more information. circle 282)

Hitachi Sales Corp. of America; 401 W. Artesia Blvd., Compton, CA 90220; (213) 537-8383 (For more information, circle 283)

IBM Corp., Entry Systems Division; PO Box 1328, Boca Raton, FL 33432; (800) 447-4700 for nearest IBM dealer, (800) IBM-3333 for nearest IBM Product Center (For more information, circle 284)

IBS Corp.; 2700 E. Imperial Highway, Building A, Brea, CA 92621 (For more information, circle 285)

MicroTouch Systems, Inc.; Ten State St., Woburn, MA 01801; (617) 935-0080 (For more information, circle 286)

NEC Home Electronics USA; 1401 Estes Ave., Elk Grove Village, IL 60007; (800) NEC-SOFT (For more information, circle 287)

Orchid Technology; 47790 Westinghouse Drive, Fremont, CA 94536; (415) 490-8586 (For more information, circle 288)

Panasonic Industrial Co.; One Panasonic Way, Secaucus, NJ 07094; (201) 348-7292 (For more information, circle 289)

Paradise Systems, Inc.; 217 E. Grand Ave., South San Francisco, CA 94080; (415) 588-6000 (For more information, circle 290)

PC Designs, Inc.; 11105-B 56th St., Tulsa, OK 74146; (918) 252-5550 (For more information, circle 291) PC's Limited; 1611 Headway Circle, Building 3, Austin, TX 78754; (512) 339-6800 (For more information, circle 311)

Persyst, Div. of Emulex Corp.; 3545 Harbor Bhd., Costa Mesa, CA 92626; (714) 662-5600 (For more information, circle 312) PDS Video Technology; 1152

PDS Video Technology; 1152 Santa Barbara St., San Diego, CA 92107; (619) 222-7900 (For more information, circle 292)

Princeton Graphic Systems; 601 Ewing St., Building A, Princeton, NJ 08540; (609) 683-1660 (New Jersey), (800) 221-1490 (For more information, circle 293)

Professional Data Systems; 20 Sunnyside Ave., Mill Valley, CA 94941; (415) 383-5537 (For more information, circle 294)

Quadram Corp.; 4355 International Blvd., Norcross, GA 30093; (404) 923-6666 (For more information, circle 295)

Qubie Distributing; 507 Calle San Pablo, Camarillo, CA 93010 (For more information, circle 296)

Quimax Systems, Inc.; 844 Del Rey Ave., Sunnyvale, CA 94086; (408) 773-8282 (For more information, circle 297)

Sakata USA Corp.; 651 Bonnie Lane, Elk Grove Village, IL 60007; (312) 593-3211 (Illinois), (800) 323-6647 (For more information, circle 298)

Samsung Electronics America; 117 Seaview Drive, Secaucus, NJ 07094; (201) 587-9600 (For more information, circle 299) Sigma Designs, Inc.; 2023 O'Toole Ave., San Jose, CA 95131; (408) 943-9480 (For more information, circle 300)

Sony Corp. of America; One Sony Drive, Park Ridge, NJ 07656; (800) 222-SONY (For more information, circle 301)

STB Systems, Inc.; 601 N. Glenville, Suite 125, Richardson, TX 75081; (214) 234-8750 (For more information, circle 302)

Tatung Co. of America, Inc.; Information and Communications Div., 2850 El Presidio St., Long Beach, CA 90810; (213) 637-2105 (For more information, circle 303)

Tecmar, Inc.; 6225 Cochran Road, Solon, OH 44139; (216) 349-0600 (For more information, circle 304)

Thomson Consumer Products Corp.; 330 Washington St., Suite 509, Marina Del Ray, CA 90292; (213) 821-2995 (For more information, circle 305)

Tseng Lobs, Inc.; 205 Pheasant Run, Newtown, PA 18940; (215) 968-0502 (For information, circle 306)

TTX Group; 3660 Paseo Sonrisa, Walnut, CA 91789; (714) 595-6146 (For more information, circle 307)

Video-7, Inc.; 550 Sycamore Drive, Milpitas, CA 95035; (408) 943-0101 (For information, circle 308)

Vutek Systems; 10855 Sorrento Valley Road, San Diego, CA 92121; (800) 621-0852 ext. 152 (For more information, circle 309)

Wyse Technology; 3571 N. First St., San Jose, CA 95134; (408) 946-3075 (For information, circle 310)

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A Data General/One With Crisp Display

DATA GENERAL/ONE MODEL 2 is compatible with the IBM PC. It comes with either an electroluminescent (EL) or enhanced liquid crystal display (LCD) screen of 25 lines by 80 columns. The system comes with 256k RAM, one builtin 3.5-inch disk drive, a serial and a parallel port, MS-DOS, battery and charger (LCD version only); options include memory expansion up to 640k, a second diskette drive (\$200), a 10Mb hard disk (\$1,200), a color adapter card (\$325), a 300-/1200-bps modem (\$450) and an external battery (for the EL version; no price available). The basic system of the LCD version retails for \$1,795; the basic system of the EL version retails for \$2,795. Data General Corp., 4400 Computer Drive, Westboro, MA 01580; (617) 366-8911. (For more information, circle 263 on the Free Information Card.)

The second generation of the Data General/One laptop computer (EL version) has an electroluminescent display that is as good as a full-size CRT. While only seven-eighths of an inch thick, the amber screen is light-emitting and can be read in any lighting condition. This, and the fact that the DG/One Model 2 comes with an optional 10Mb hard disk, makes this truly a portable personal computer. The only drawbacks to the machine are the cramped keyboard, the external battery pack—which only lasts up to 3 hours—and the high price. It is also a little heavy.

Certainly the most dramatic improvement in the DG/One is the display. There is virtually no difference between the EL and the display on a good monochrome CRT. The screen measures about 7.75 inches wide by 5 inches high, and has a diagonal measure of 9 inches-very similar in dimensions to the monitors on personal computers from Compaq and Corona. This makes it proportionally equivalent to a fullsize screen (a 2 to 1 aspect), so there is no flattening or elongation in graphic images. The screen is 80 columns wide by 25 lines and has a resolution of 640by-200 pixels—with bit-mapped capabilities. The graphics are so good that a pie chart looks almost fully rounded.

While the EL display is clearly superior to a LCD screen (including the backlit variety), the Model 2 can be purchased with a newly enhanced LCD for \$1,000 less than the EL model.



The Data General/One Model 2 offers an optional EL display and 10Mb hard disk drive.

Another important difference between this DG/One and its forerunner is the optional, internal 10Mb hard disk. Now you can carry around a full complement of software, and you don't have to worry about disks. Even very large spreadsheets aren't a problem. Since the new DG/One can also be expanded to 640k of RAM, you won't feel like you're carrying around a toy when you travel. If you choose not to go with the hard disk, you can get an additional internal 3.5-inch drive and an optional 5.25-inch external drive.

ith the external 5.25-inch drive (\$795), you can easily copy programs onto a 3.5-inch format—if they aren't copy protected-or transfer data files back and forth between media. If you have only the 3.5-inch drive, there is a program from Data General that will allow you to copy programs directly from a desktop personal computer to the DG/One, or back the other way. The program is called PC Liaison (\$180). The only hitch here is that you'll have to be extremely patient in copying over programs. It took 9 minutes to copy the Leading Edge Word Processor, whereas it takes only about 1.3 minutes to copy

the program from one 5.25-inch disk to another on a Compaq.

There is also a wide range of software available for the DG/One in 3.5-inch format. The number of companies that have committed to producing their software in the 3.5-inch format totals somewhere between 60 and 80. This includes Lotus, Ashton-Tate, Microstuff, Software Publishing, MicroPro and Word-Perfect, Inc. This list should expand now that IBM has "legitimized" the 3.5inch format on its Convertible. We were not able to test 3.5-inch programs written for the Convertible-nor has Data General yet—but Data General says it is working with software companies to make sure there is no compatibility problem.

Some of the other nice features of the DG/One Model 2 include the built-in parallel and serial ports and the two expansion slots in the rear of the machine. (The original DG/One had no expansion slots.) The slots enable you to easily install options on your own. These include expansion memory, a 1200-bps internal modem, and interfaces for a color monitor adapter, IBM-compatible asynchronous communications, a 5.25-inch disk drive and an expansion chas-

PRODUCT REVIEWS

sis for PC-compatible circuit cards. Also, the screen is somewhat adjustable-from about 80 degrees to 110 degrees. (The LCD Model 2 allows you to push the screen back until it's flat against the top rear of the machine so you can hook up an external CRT).

The portable can be tilted forward by swinging down the rear panel, making the keyboard a bit more comfortable to use. However, the keyboard itself is one of the DG/One Model 2's main drawbacks. The keys, although full-sized (except for the function keys at the top) are pushed closer together to get them all into the 11.75-inch width of the keyboard. This makes it feel cramped. I also found the placement of the arrow keys in a line at the bottom right hard to get used to. Part of the problem is that, with your hands in the normal typing position, you can't see the up and left arrow keys. And if you want to invoke the Home or End keys, you have to use the Ctrl key along with the left and right arrow keys.

S till another drawback of the DG/ One is its weight. Data General says the unit weighs under 12 pounds. But the model we tested—which had 640k with a hard disk-weighed a little over 13 pounds. Then you have to add in the weight of the power pack, another threeand-a-quarter pounds. Together with the soft carrying case, it was a shoulderbreaking 18-and-a-half pounds—which is not something you want to jog to the plane with. If you add the internal modem and start thinking about carrying around the external printer, "portable" becomes a more elastic epithet.

The battery pack for the EL version of the DG/One also stretches the term "portable." DG was promising August delivery of an external unit only (at a price to be announced) that lasts just three hours before it needs recharging. Most other laptop computers have batteries that last at least twice as long. The LCD version of the DG/One is one.

Despite the drawbacks, however, the new DG/One (EL version) is a completely readable, memory-rich laptop. It goes a long way toward answering the criticisms that have been leveled at this breed of computer. But you will pay dearly for its gifts-an EL Model 2 with the 10Mb hard disk will cost \$3,995; and fully loaded with an additional 384k RAM and a modem, it will cost \$5,085 (this doesn't include the external battery pack).

Between A Handy Calculator And A Spreadsheet

IT FIGURES runs on the IBM PC, XT, AT, PCjr and MS-DOS compatibles; requires 100k RAM and one floppy disk drive; \$39.95 retail; SimplSoft Products Inc., 5330 Sterling Drive, Suite C, Boulder, CO 80301; (303) 444-8771. (For more information, circle 251 on the Free Information Card.)

sing a spreadsheet for a relatively simple calculation can be more trouble than it's worth, what with setting up a column for text, a column for data and then writing formulas. More often than not, you end up deciding that it's faster to jot the problem on a piece of paper and then get the hand-held calculator out of your desk drawer.

That's where It Figures could come in handy. This inexpensive utility, called an electronic worksheet, is designed for users who need more than a calculator but less than a spreadsheet. It is 20 lines deep and three columns wide-one for formulas, one for the result and a third for comments. For some applications 20 lines isn't enough, so worksheets can be chained together.

You enter information one row at a time. Formulas are preceded by a backslash and anything appearing after a semicolon goes into the comments section. If you wanted to calculate what percentage of the miles you drive are business versus personal, for instance, you could begin by entering \STOP; Ending mileage. STOP in essence becomes a formula name in the first column, .00 appears in the middle (results) column and the phrase "Ending mileage" appears in the third (comments) column. The next line might be START:Starting mileage and the next \STOP-START; Total miles. Values are entered in a straightforward manner, by typing, for instance, Stop=19873 and Start=19612. Those numbers would appear in the results column. Once values are assigned to the parts of a formula, It Figures calculates total miles. The next line might be \BIZ; Business miles and the following line \BIZ/(STOP-START) *100. Enter the number of business miles, say Biz=83, and It Figures would then calculate the percentage that is for business use.

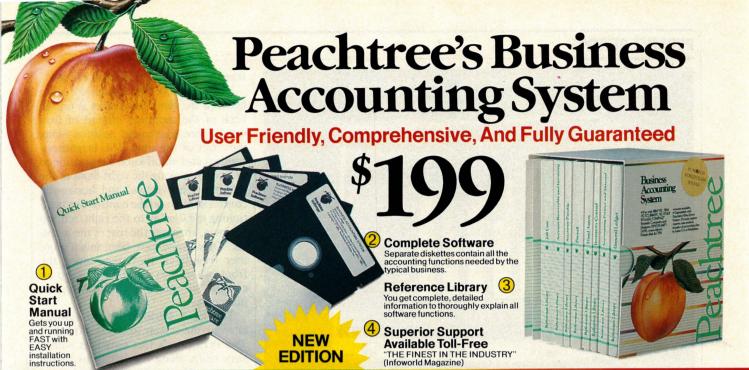
It Figures comes with more than 40 templates ranging from stock return analysis to a small-business balance sheet and simple interest calculation. Built-in mathematical functions include the usual addition, subtraction, multiplication, division, exponents and negative values, plus others like square roots. It will show up to 22 digits (21 decimal places).

It Figures won't replace Lotus 1-2-3. of course, but for those users who don't need the power and price of a spreadsheet, it's definitely an easy step up from a calculator.

-Sandra R. Reed

```
STOCK RETURN ANALYSIS
    STOCK
                                             8,000.08 1
3,000.08 2
   V+INVEST
                                                           Amount Invested
   \+MARGIN
                                                          Margin funds
   \+INTEREST
                                                   .11 3
                                                          Interest on margined funds
                                                22.88 4
23.58 5
  V+BUY
                                                           Purchase price of shares
   \+SELL
                                                          Sell price of shares
   \+SHARES
                                                500.00 6
                                                          Number of shares purchased
   Y+DAYS
                                                 75.00
                                                           Number of days stock held
   Y+DIU
8
                                                          Dividend anticipated/share
11
   \+INVEST+MARGIN
                                            11, 888. 88 11
                                                           Total funds invested
                                                67.81 12
   +INTEREST*MARGIN/365*DAYS
                                                            Cost of margin funds
13
   \+BUY*.8025*SHARES+35
                                                            Buy commission
Sell commission
                                                       13
                                                62.50
   \+SELL*.8825*SHARES+35
                                                64.38 14
                                            11,825.00 15
638.32 16
15
   \+(SELL+DIU)*SHARES
                                                            Gross sale dollars
   V+NET
16
                                                           Net Profit
   V+NET/INVEST/1X
17
                                                            % Return On Investment
18
19
28
   \+NET/INVEST/DAYS*365/1%
                                                38.34
                                                       18
                                                            z Annualized Return
                                                       28
Enter:_
```

-Henry Fersko-Weiss | Each worksheet row is divided into columns showing a formula, result and comment.



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 CRT inquiries on customer balances, sales, and payments
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- Automatic calculation of finance charges

- Automatic calculation of manifectuages
 Unlimited customers
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 Control report audit trail for all entry programs
 Generates invoices and statements on plain or
 preprinted forms

ACCOUNTS PAYABLE

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- Cash requirements forecasting by due date CRT inquiries on vendor balances, purchases,
- and payments
- anio payments

 Unlimited vendors

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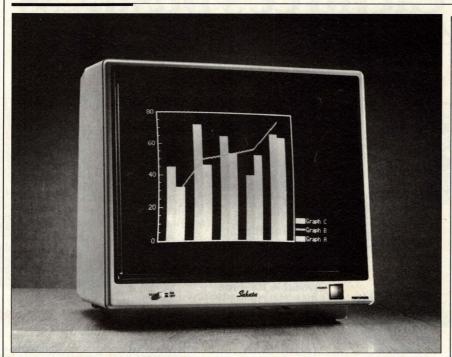
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The EGA Performer from Sakata includes a text button on the front of the monitor.

Two Hi-Res Monitors For Text Or Graphics

THE EGA PERFORMER is a color monitor designed to be used with an enhanced graphics adapter; \$799 retail; Sakata USA Corp., 651 Bonnie Lane, Elk Grove Village, IL 60007; (312) 593-3211. (For more information, circle 259 on the Free Information Card.) THE CM-1380 is another EGA monitor; \$849 retail; Tatung Co. of America, Inc., 2850 El Presidio St., Long Beach, CA 90810; (213) 637-2105. (For more information, circle 260 on the Free Information Card.)

he Sakata EGA Performer and Tatung CM-1380 are perfect examples of the finicky nature of EGA monitors. Basically, the features are the same, a 640-by-350-pixel resolution, .31mm dot pitch, 20MHz bandwidth, and 13-inch diagonal screens. (See BUYER'S GUIDE.) The first thing you'll notice with both displays is the larger variety of colors on the screen compared to a RGB setup. Sixteen colors can be displayed simultaneously out of a palette of 64. Standard RBG monitors and color graphic adapter boards can only show four colors from a palette of 16. Also, because of the larger number of pixels on the screen, an EGA display is noticeably sharper. Nevertheless, there are differences in the way these two monitors display the colors and how the brightness and contrast controls affect the color saturation.

Our preference fell slightly toward the CM-1380 from Tatung. It offered a clear and bright screen even when the brightness and contrast settings were turned down. As for the other monitor, the EGA Performer's etched glass, nonglare screen reduced glare but created a slight haze over the display. This muted the colors somewhat. Unless both settings were turned all the way up, the screen had a slightly washed-out look.

On the Sakata monitor, the colors held their shading fairly well as the brightness and contrast controls were adjusted. Dark blue, for example, was dark blue no matter how high or low the brightness and contrast knobs were set.

The colors on the Tatung changed shades more noticeably as the brightness and contrast were adjusted. An example of this was a change in the color black, from a solid black with the controls set at their highest to a light gray with the controls turned down a considerable amount.

The CM-1380 has a text switch that allows you to display text in green or amber. This is a welcome alternative to staring at screen after screen of white text, the standard display color for text on an EGA monitor. The amber display actually ranges from yellow to orange, depending on how you set the brightness and contrast controls. The green screen remains the same shade of green,

regardless of how the controls are set.

Unfortunately, the switch to move between the three text colors is on the back of the monitor, instead of in a much more convenient position along the front of the unit. The brightness, contrast and on/off knob are positioned in a column along the right front of the monitor. The vertical and horizontal control knobs, and the controls for positioning the display to the right, left, up or down, are along the rear of the monitor. They would have been much more user friendly if they were along the front, where you could easily keep an eye on the screen while making adjustments.

The EGA Performer's text switch changes the screen to a green display. The Performer's text switch is within easy reach along the left front of the monitor. The brightness and contrast settings are also along the front, positioned out of sight under the lower ridge of the monitor. The controls for shifting the display from side to side and up and down are on top of the monitor, enabling you to view the screen as you alter the display's position. This, unfortunately, is not the case for the vertical and horizontal hold controls. They're located along the rear of the monitor.

Text on both monitors was clear, crisp and easy to read. There was no flickering or blurring when scrolling or changing screens.

oth monitors automatically switch to the lower-quality color, graphic adapter display mode when operating with a CGA board or software designed to provide CGA display. So, you could start using one of these monitors before upgrading to an EGA board.

The EGA Performer weighs in at 31 pounds compared to 25 pounds for the CM-1380. The Performer is about one inch taller and one inch narrower than the CM-1380.

Which one of these monitors is better? That's a matter of personal preference. Both performed well, offering good color graphics and text display. We preferred the Tatung's display because it avoided the haziness of the EGA Performer's etched glass non-glare screen. But we liked the fact that the EGA Performer's text switch is on the front of the monitor. The Sakata Performer also lists for \$50 less. Both are sturdy products that are typical of what's available in the increasingly crowded high-resolution monitor field.

-Patrick Honan

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Augmenting Your Vocabulary With Pop-Up Synonyms

WEBSTER'S NEW WORLD ON-LINE THE-SAURUS, version 1.0, runs on the IBM Personal Computer, PC XT, PC AT and PCjr; \$69.95 retail; Simon & Schuster, 1230 Ave. of the Americas, New York, NY 10020; (212) 245-6400. (For more information, circle 255 on the Free Information Card.)

S traightforward, fast and easy to use, Webster's New World On-Line Thesaurus does a good job of replicating the feeling of flipping through a paper thesaurus on the screen of IBM and compatible personal computers.

Individual synonym entries appear in neat, systematized windows that are formatted to resemble the pages of Webster's New World Thesaurus, the software's paper counterpart. Synonyms are categorized within the window by part of speech and shade of meaning. References to related synonyms are provided. You replace a word in your text by placing the highlight bar on the alternative word and hitting F10. If you change your mind and wish to reinsert your original word without retyping it, you can reenter the thesaurus and use the Whoops! command (F9).

Webster's will maintain correct capitalization when a word change is made. It will also change "a" to "an" (and vice

versa) before a word if it is necessary.

Using the arrow key to move the cursor to a potential replacement word within a synonym window and then hitting return will bring up another window of synonyms for *that* word, allowing you to search for synonyms of synonyms. The windows will then stand side by side, like the pages of a book, ready for your perusal.

Webster's has some features that make scrolling through the program's "electronic pages" easier than thumbing through the pages of a paper thesaurus. This enhances one of the really valuable ways to use any thesaurus—by browsing through the word treasury, following a thread of related words to help spark an idea.

When you have two pages on the screen at once, you can switch between them with the F2 key. If you need to review the word in context before making a selection, F3 moves you back to the document screen. F4 brings up a Note Page on which you can list possible word replacements.

If your search procedure begins to lead you too far afield, Webster's makes it easy to retrace your steps. By pressing F7, you can regress one page at a time or call up a page that will list your synonym lookups for you.

The Note Page and the Retrace Page are typical of the subtle touches this program offers. Such features make Webster's more than just a simple, intuitively used program, however. You can operate the program at a minimal level

by booting it up and using the help screen. But to take advantage of the program's full capabilities, you'll have to read key sections of the documentation carefully. We had to use the program several times, and read through the manual more than once, before we felt comfortable with all its features. An onscreen tutorial would have been a welcome addition, as would an index of key terms at the back of the manual. (The manual does provide a number of helpful appendixes on word usage.)

Webster's uses either an "intelligent scan," which scans groups of words around the word processor's cursor and searches for a replacement for a phrase, or a "limited scan," which searches for a single word. The program also enables you to edit a synonym (to pluralize it, for example) before you use it as a replacement. Webster's handles common prefixes and suffixes by stripping them from a root word before lookup. It will then reattach the prefix or suffix before replacement.

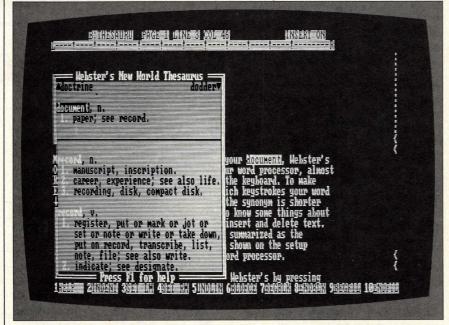
ecause the program is RAM-resident, it sits behind your word processor and can be brought to the screen when you hit the Thesaurus Entry keys (Alt-F10, or a combination of your choosing). Webster's consists of a control program, which resides in memory, and a dictionary disk that is accessed through the disk drive. The dictionary has over 15,000 synonym entries, and over 100,000 total synonyms. At least 44k of free memory is required to use Webster's with other programs.

As with other RAM-resident programs, a hard disk is highly recommended with Webster's On-Line Thesaurus. (The program is not copy protected.) In a dual floppy system, if you forget to follow the program's prompts for inserting the dictionary or inserting the word processor, you can damage your data file. The disk swapping can be annoying in any case.

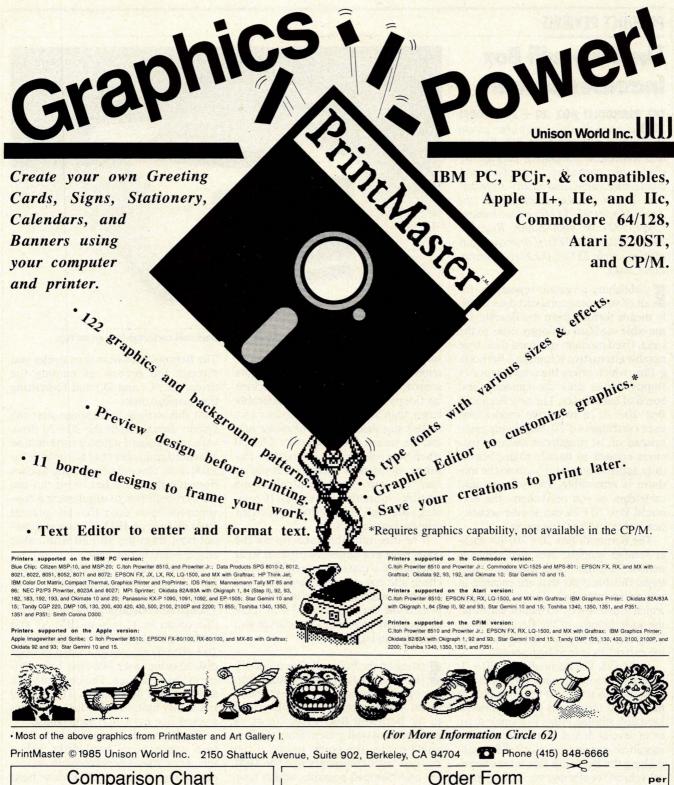
Webster's works with a large number of word processors, including Word-Perfect, MultiMate, Microsoft Word, Bank Street Writer, PFS:Write, Writing Assistant, WordStar and WordStar 2000. It also can be used with Framework, SideKick, Symphony, Think-Tank and other programs.

Webster's New World On-Line Thesaurus is an effective tool that offers significant value to writers and executives by helping them broaden their selection of words.

−Bob Sillery



Webster's On-Line Thesaurus enables you to bring a window of synonyms on-screen.



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PRODUCT REVIEWS

The Bernoulli Box Increases Capacity

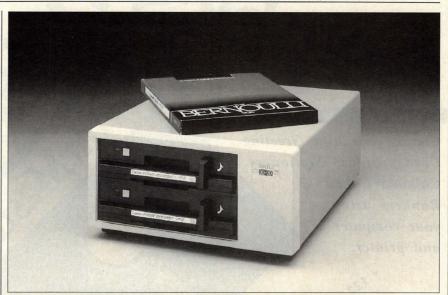
THE BERNOULLI BOX 20 + 20 (MODEL 220) is a two-drive disk cartridge system that works with the IBM PC, XT, AT and compatible computers; package includes two cartridges, controller card, connecting cable, and utility software. The 20+20 is also available for the Apple Macintosh. \$4,695 retail; Iomega Corp., 1821 W. 4000 South, Roy, UT 84067; (801) 778-3000. (For more information, circle 257 on the Free Information Card.)

stablishing a central repository for all of your programs and data usually means turning from the flexible, removable medium of floppy disks to the rigid, fixed medium of a hard disk. One notable alternative is Iomega's Bernoulli Box, which offers the convenience of floppy drives and the capacity and speed of hard drives. The new Bernoulli Box 20+20, a two-drive model that uses cartridges of 20 megabytes each, instead of 10 megabytes each, is spacious enough to handle many heavyduty applications. And because the medium is removable, and you can add cartridges as you need them, the Bernoulli Box 20+20 can soothe security headaches and growing pains.

The Bernoulli Box 20+20, like earlier Iomega models, uses media that is neither hard nor fixed. Instead, it uses large, flexible disks that are encased in protective cartridges. These cartridges, which measure 8 by 10 inches, slide into the wide mouths of the Bernoulli Box. Once clamped in place, the disks within the cartridges spin at high speeds.

At \$4,695, the Bernoulli Box 20+20 is very pricey equipment. Its cost is two to five times what you would expect to pay for 40 megabytes of conventional hard disk storage, either in a single drive or in several drives. But additional 20-megabyte cartridges are only \$99 each, making the Bernoulli Box an economical vehicle for storing, say, 100 or more megabytes of information. The 20+20 is ideally suited to applications like accounting and data base management, in which information mounts continually and records from previous years must be preserved.

Even without the need for such a massive warehouse of data, however, the 20+20 might prove cost effective when security issues are factored in. Unlike conventional hard disks, the Bernoulli's



The Bernoulli Box 20+20 offers two drives. A Bernoulli cartridge is seen on top.

storehouse is mobile. Cartridges can be removed when not in use, making data security no more difficult than locking up floppy disks. Though considerably larger than floppies, three or four cartridges slip neatly into a briefcase and can be inserted into another 20+20 when you reach your destination. Ensuring that data is backed up is just as easy. You can copy the contents of one cartridge to another in less than 10 minutes, effectively eliminating the need for tape backup devices.

If neither unlimited capacity nor the convenience of removable disks is what you need in a mass-storage device, then check into conventional hard disks and tape backup drives. At less than half the price of the Bernoulli Box 20+20, these devices may provide all the storage and security you require.

S etting up the Bernoulli Box is not difficult. An adaptor card plugs into any open expansion slot inside the computer. A cable connects the adaptor card to the Bernoulli Box, which draws its power from a wall outlet. (Since the Bernoulli has its own power source, it can be used with computers like the IBM PC and Compaq portable, which have modest power supply units.) The Bernoulli Box itself is about 12 inches wide, 6 inches high and 15 inches deep, and it can't sit more than two feet or so from the computer. Making room for the Bernoulli drive may be the most onerous setup chore. Once the hardware is in place, the included utility software guides you through alterations of MS-DOS's configuration file (CONFIG.SYS) so DOS will recognize the added drives.

The Bernoulli software then guides you through the process of naming the drives (i.e., C: and D:) and formatting the cartridge disks.

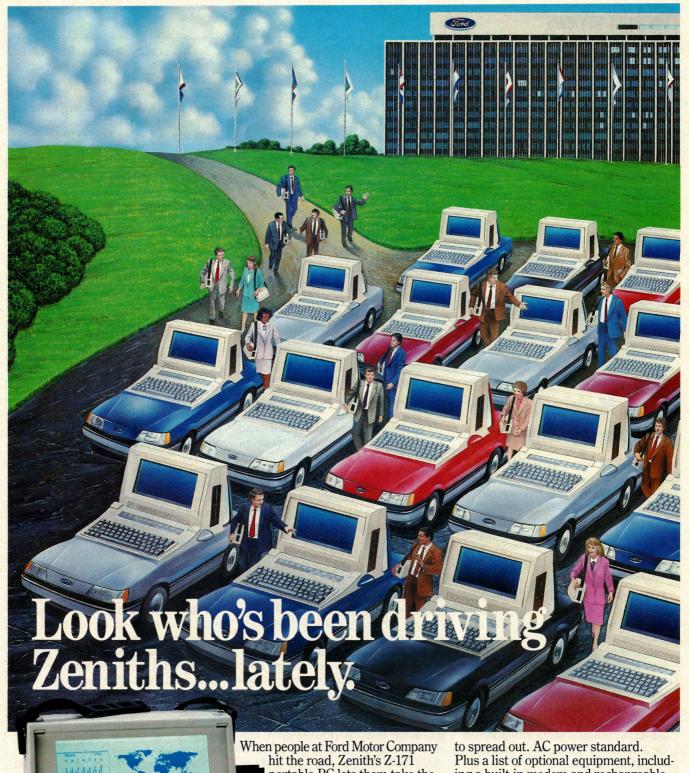
At this writing, you cannot start the system directly from the 20+20 drive with the standard adaptor card, but an enhanced controller card is available for \$100 more that does enable you to boot from the Bernoulli Box. You can use the Bernoulli Box to supplement a conventional hard disk, like an internal fixed drive in an IBM XT, but you cannot boot from the 20+20 with either adaptor card in that case.

Up and running, the Bernoulli Box 20+20 performs commendably when compared to conventional hard disks. Though still not quite as fast as the hard disk drives we've seen in IBM AT and Compaq Deskpro 286 computers, the 20+20 is quick enough to step through disk-laboring tasks like data base sorting in timely fashion. The Bernoulli Box should prove dependable. The 20+20 is a sturdy unit, and the disk cartridges worked fine even after some abuse.

The Bernoulli Box is a little noisier than conventional hard disks. When idle, a low hum is peppered with persistent ticking—the sound of the drive head moving from track to track so as not to wear the disk unevenly.

In many respects, the Bernoulli Box 20+20 is simply a better storage medium than either floppy disks or hard disks. Certainly, \$4,695 represents a high price for convenience alone. But the infinite capacity and inherent security of cartridge disks can be crucial to some applications.

-Christopher O'Malley



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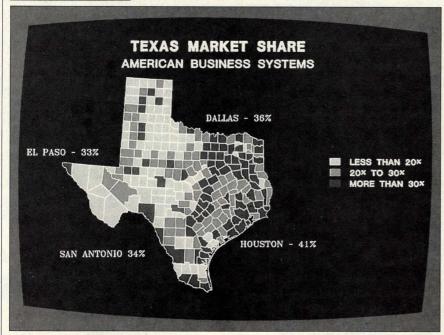
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Market share or demographic data can be readily mapped out with legends and titles.

Map Making Made Simple By Menus

MAP-MASTER runs on the IBM PC, XT, AT, 3270-PC and compatible computers with 384k of memory, two disk drives and a graphics adapter/display; copy protected; \$395 retail; Decision Resources, 25 Sylvan Road South, Westport, CT 06880; (203) 222-1974. (For more information, circle 261 on the Free Information Card.)

ap-Master is a flexible program that offers an easy way to customize maps in order to display the geographical distribution of data. If your company needs to track sales by region, for instance, putting the information on a map can communicate the data more effectively. The program can be used to show market shares for a particular area, population profiles (such as average age or political party affiliation) or the location of manpower, equipment, or branch offices.

Map templates come with predefined boundaries such as state or county lines or ZIP code zones. You can use the templates as they are or pick and choose the boundaries you need. You complete a map with shading and symbols.

Maps can include a legend as well as labels and titles in any of several fonts and sizes. You can move and size maps. For additional impact, you can display a close-up view of a certain area of the map or you can "explode" portions of the map in order to emphasize certain boundaries.

The result is presentation quality, and it can be sent to a printer, plotter or device such as the Polaroid Palette.

Map-Master is easy to use. The program lets you create a map almost entirely through menu options.

Before you start thinking about all the statistics you want to display, however, there are a few things to consider. First, Map-Master includes only a map of the United States divided by state, and sample maps of Louisiana divided by parish (county) and Manhattan divided by ZIP code. If you want to display any other geographical boundaries, you must special order them for an additional cost. Depending on how extensive your company's needs are, an intricately mapped United States could easily cost more than the program. A U.S. map divided by telephone area codes runs \$95; one segmented by congressional districts runs \$295. A U.S. map showing all counties is \$195; the entire U.S. by three-digit ZIP code regions, \$195; for five-digit ZIP codes, a template rises to as much as \$295 per state. And the program does not allow you to draw in your own boundaries. Also, Map-Master is copy protected.

As for hardware, we recommend using Map-Master only on a hard disk system. This is because Map-Master comes on four program disks and one sample disk. If you use a two-floppy system, you will find yourself involved in a lot of time-consuming disk swapping.

Each map consists of four parts: boundaries, data, titles and a legend. To create a map, use the arrow keys to highlight the Create Map menu option, and press Enter. You are prompted to name the map and to select a boundary file (such as the United States) from a list. An outline of the map then appears onscreen, with a list of all the boundaries (such as the states on the U.S. map) on the right.

To include a state in the map, press I to mark it (pressing F2 includes all of them). Thus, you can create maps that display only states within a certain region. Map-Master anticipates that you will enter data next, so it displays the Editor Menu with the choice, Data, highlighted.

Data that you load into a map is stored as a set of variables. For instance, population statistics are stored as one set of variables, while median age is stored as another. You can create variables by entering data manually, importing data from a spreadsheet or performing simple calculations on two variables. Addition, subtraction, multiplication and division are built in.

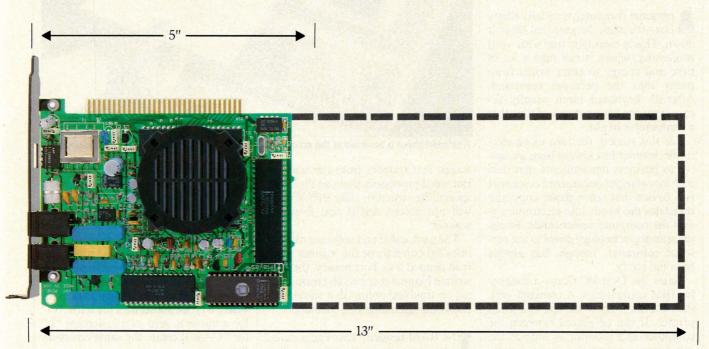
ne indispensable feature of Map-Master is the DataGrabber, which allows you to import spreadsheet files that are in DIF, SYLK or ASCII format. You can grab an entire section of your spreadsheet at once, but only if it is formatted in a way that Map-Master understands. For instance, labels that identify the boundaries (such as Eastern Region) must occur in the top row or left-most column of your spreadsheet, must be in alphabetical order and cannot contain numerals.

Data can be displayed on the map in several ways. You can mark specific spots with symbols, shade areas with hatch patterns and color or do both. Up to eight data ranges can be specified in a legend. You can also display data based on conditions such as "only those variables less than or equal to \$99,000."

Map-Master includes many flexible features that are also easy to use, even for the non-typist and non-artist. The overall cost, both in dollars and the 1.5Mb in hard disk space you'll need to dedicate to the program, may make you give Map-Master a second thought. If, however, you need to present your statistics in an eye-catching way—without agonizing over the software or waiting for the art department—Map-Master may be your best option.

-Cheryl Spencer

The largest selling 1200 bps modem just got smaller.



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Text Entry Without Using The Keyboard

THE DEST PC SCAN is a page scanner that transfers typewritten copy into several types of word processors. It costs \$1,995, but requires Dest's Text Pac software, which costs \$595. Dest Corp., 1201 Cadillac Court, Milpitas, CA 95035 (408) 946-7100. (For more information, circle 254 on the Free Information Card.)

personal computer is usually pretty fast—it's often the user that slows it down. This is especially true with word processing, where it can take a lot of time and energy to enter words from paper into the personal computer. After all, keyboard input usually accounts for the largest chunk of time that a computer is in use.

For this reason, the idea of an electronic scanner has always been attractive to business departments that deal with lots of paper documents. A scanner is a device that reads paper copy and translates the words into electronic signals the computer understands. Bringing scanner technology down to the personal computer, though, has always been too costly.

Enter the Dest PC Scan—a scanner for IBM compatibles. A compact unit, the PC Scan is about the size of a small printer. It can be placed between the computer and monitor as long as the computer is sitting flat on your desk. Paper is fed into the scanner in much the same way paper is fed into a facsimile machine—a paper guide takes the sheet in, reads it and rolls it out.

The hardware connection between the computer and scanner is made with a specially designed half-slot interface card that comes with the scanner. A special cable is also included. Placing the unit between computer and monitor makes sense.

In order for the computer to understand the hard copy the scanner is reading, it must be running Dest's Text Pac software. This software is RAM-resident, so you can call it up in the middle of your word processor. Then, you can insert all the scanned text right into one of your word processing files.

Though Text Pac can be designed to work specifically with DisplayWrite 3, MultiMate, WordStar or even WordStar 2000, it can also be set up to produce straight ASCII-formatted text. So, any word processor that uses straight ASCII text (such as the SideKick notepad) can



A printed sheet is inserted in the scanner located between the computer and monitor.

accept text transfer from the scanner. But word processors that use their own special file structure—like PFS:Write will not accept ASCII text from the scanner.

The card, cable and software must be installed correctly or the scanner won't read printed text. Fortunately, the well-written manual contains an entire chapter on troubleshooting that should unravel entanglements you encounter.

The RAM-resident Text Pac is called up by pressing Alt-S. (If this conflicts with another program, you can assign a different key combination.) Once Text Pac is activated, a window prompts you to insert the typewritten page into the scanner. If the scanner absolutely can't read the page, you press Q to disable the scanner. But if it can read even some of the page, the scanner keeps going and enters the text it does understand.

When the scanner reads a document into the computer, it maintains the margins and much of the other formats of the text. We scanned several kinds of text into WordStar and the SideKick notepad and found the scanner to work best when the page is typewritten or created by a daisywheel printer. Highquality dot matrix type was also read with little trouble.

The scanner has a great deal of difficulty reading typeset and laser-printed text. According to the company, this is because laser-printed and typeset letters are not always one of the 12 types of fonts or two pitch sizes the scanner is capable of reading. Some laser printers, however, produce type that is so close to one of the 12 fonts that the scanner will accept it, according to the company.

Some of the formatting didn't translate properly when tabs, large amounts of white space or columns were in a document, even though Text Pac supposedly lets you account for these in its setup program. Hard copy that was not properly prepared to begin with—as in cases where a typist substitutes the letter "O" for a numeric zero or a lowercase "L" for "1"—will create the same errors on the screen.

But when a cleanly printed page is inserted into the scanner, it reads it in less than a minute and then transfers the text to the word processor, also in less than a minute. A read-through is always necessary to clean up errors. With corrections, a 15-page document can probably be transferred to your word processor and proofread in about a half hour.

The price of the scanner and software are relatively low for this once-prohibitively expensive technology. But to justify the nearly \$2,500 purchase, you'll really need to use the scanner heavily. Law firms or legal departments within large corporations are good candidates to use the scanner, since they may want to scan in briefs with a minimum of data entry.

So, for now, the Dest PC Scan provides a vertical solution to the common problem of data entry. As the price of this and other scanners come down, perhaps we may all have one on our desks someday.

-Jim Bartimo

Two great reasons to buy Turbo Pascal:

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Paint the menu screens

Paint the application screens

Define the datafile(s) on the screen

System Builder automatically writes the program code and combines the datafiles into a relational database

Print your listings

Program source code listing Self-documenting program (includes screen schematics)

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Start using the completed system

*System Builder will generate 2,000 lines of program code in approximately 6 seconds

REPORT BUILDER CYCLE:

Key in the report parameters on screen

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• New report format for reference Report element layout

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Print your listing

Report program source code listings

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Attach the new report module to your

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Programming	2 minutes	10 hours
Elapsed time to completed system	1 hour and	14 hours

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System Requirements—System Builder/Report

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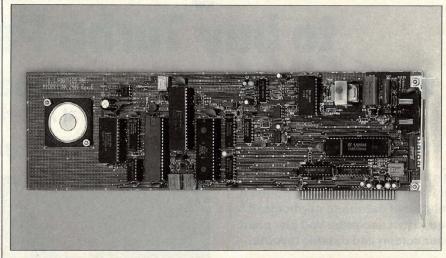
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PRODUCT REVIEWS



The Microlink 2400 has all the basic features, including auto dialing and auto answer.

A No-Frills, 2400-Baud Modem

microlink 2400 modem plugs into the expansion slot of the IBM PC, XT, AT and PC-compatible computers; Telepac communications software is included; \$699 retail; U.S. Robotics, Inc., 8100 North McCormick Blvd., Skokie, IL 60076; (312) 982-5001. (For more information circle 258 on the Free Information Card.)

All the standard features you would expect in a good modem are present in the Microlink 2400. It operates at 2400, 1200 or 300 baud, depending on the system it is communicating with at the other end. It is Hayes compatible and operates in half- or full-duplex mode, has a speaker so you can hear the communications process and has both auto dialing and auto answer features.

While the modem uses the full AT command set, it has added three help screens: one for a summary of the command set, one for the S-register functions, and one for the dial command options. You will probably never have to worry about the command set, or S-registers—which set such things as the number of seconds the modem waits for a dial tone before dialing, or the duration of touch tones during dialing—but if you ever do, it's nice to have help screens.

The Microlink 2400 records the duration of your communication sessions in hours, minutes and seconds. This feature lets you keep very accurate tabs on your communication costs. And you can also use the modem clock as a real-time clock.

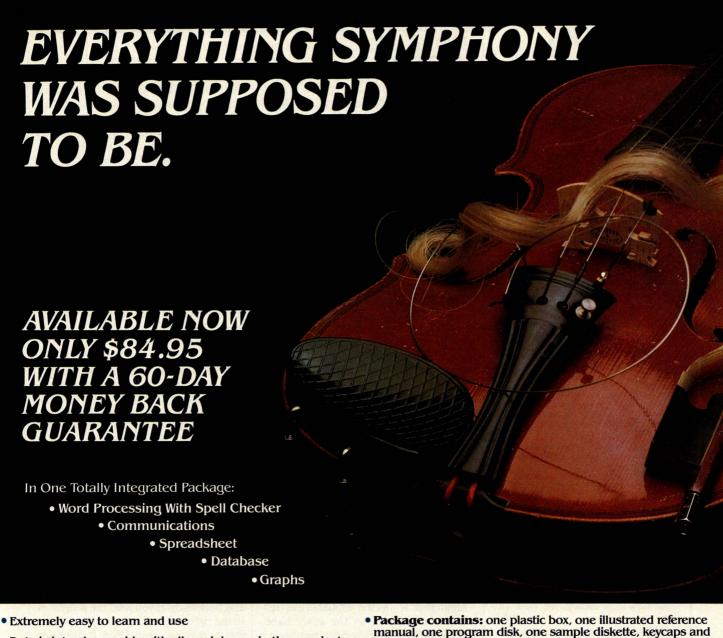
In addition to automatically adjusting to the baud rate of incoming calls, the modem will fall back to 1200 baud if the modem it is connecting to operates at that speed. But, if Microlink is calling a 300-baud modem, you will have to adjust the baud rate in the communications package you use. Microlink also automatically changes to touch-tone or pulse dialing.

The modem supports Com 1 through Com 4. The Com ports are set by switching jumpers on the board. There is also a set of 10 DIP switches for changing some of the basic operating parameters of the modem, like answering calls on the first ring, or recognizing the AT command set. Microlink 2400 will work with most communications programs, but it also comes with U.S. Robotics' own full-featured package, Telpac, at no additional charge.

Telpac uses pull-down menu windows to place calls, transfer files and set communications parameters. The software can be used to communicate to remote computers, on-line services or mainframe computers. You can maintain a phone directory of up to 20 entries, and as many directories as will fit on your disk. You also can automatically log on to data base systems or leave your computer in auto answer mode for use remotely. There are three levels of security, and you can create a log file that will record all your communications activity.

The Microlink 2400 works without a hitch, which is probably the best praise for any product, and it is competitively priced in the category of 2400 baud offerings.

-Henry Fersko-Weiss



- Data is interchangeable with all modules and other products
- Windows allow quick movement between tasks
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- user support plan
- System Requirements: IBM PC or compatibles, 512K, two 360K diskette drives, color or mono display
- Twenty-four hour **Hotline Support** (optional)



Multiple windows allow quick movement between tasks.

> Colorful graphic representations



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-Robert Lawrence, ITT INFORMATION SYSTEMS (For More Information Circle 47)

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BENCHMARKS / (Continued from page 37)

Unlike Turbo Lightning, Reference Set doesn't have a pop-in menu. It functions totally with "hot" keys, like Alt-D to activate the dictionary and Alt-T for the thesaurus. Like Turbo Lightning, the keys that Reference Set uses can be reassigned if they clash with your word processor's commands.

While Turbo Lightning checks only the word at the cursor or the full screen when you activate the dictionary, Reference Set puts a window on the screen that first checks the word at the cursor and then tells you to type in additional words for checking. Both can instantly replace the word you're checking with an alternative from their lists.

Reference Set's full-document spelling checker is a separate program that must be loaded into memory before you use it. It marks misspelled words and makes a backup of the original. Both programs let a user create auxiliary dictionaries, which might be used for non-English acronyms or words common to a particular field.

We checked how the two programs handled 25 different words by typing the words letter by letter and checking the dictionary after each letter. Generally, Turbo Lightning and Reference Set found the properly spelled word after the same number of letters. But the contexts are dramatically different. Reference Set offers fewer alternatives, sometimes only one word, and lists the words alphabetically. If the word you're checking is properly spelled, Reference Set highlights it in the alphabetical list. Turbo Lightning, on the other hand, beeps if the word is correct, gives you a message saying it's correct and tells you to press F2 if you want to see "close" words. If the word isn't correct, Turbo Lightning usually offers 23 or 24 spelling choices, with the choices weighted according to how much they sound like the word you're probably trying to spell, and by length. If the words are two, three or four letters long, Turbo Lightning includes commonly scrambled words, too.

Just for fun, while we were in the dictionary we ran a few computer-related words through both programs. Turbo Lightning confirmed correct spellings for more of the words we checked, including RAM, ROM, IBM, Borland, Tandy, WordStar and Microsoft. Reference Set said RAM, IBM and WordStar were correct but rejected ROM, Borland, Tandy and Microsoft. Neither Ashton nor Tate was recognized as spelled correctly by either program.

The differences in the thesauruses of the two programs are slight. Reference Set can deal with two-word words like hors d'oeuvres, which Turbo Lightning split into two words, and labels words "slang" where appropriate. When we sought synonyms for money, for instance, both returned the same 10 nouns, but Reference Set labeled mazuma, long green and dough as slang.

In addition, Reference Set cross-indexes all words in the thesaurus. By using the + key, you can look up synonyms for a word on a list of synonyms for another word. If, for example, you ask for synonyms for profit, the list includes revenue. When you put the cursor on revenue and press the + key, Reference Set will show you synonyms for revenue.

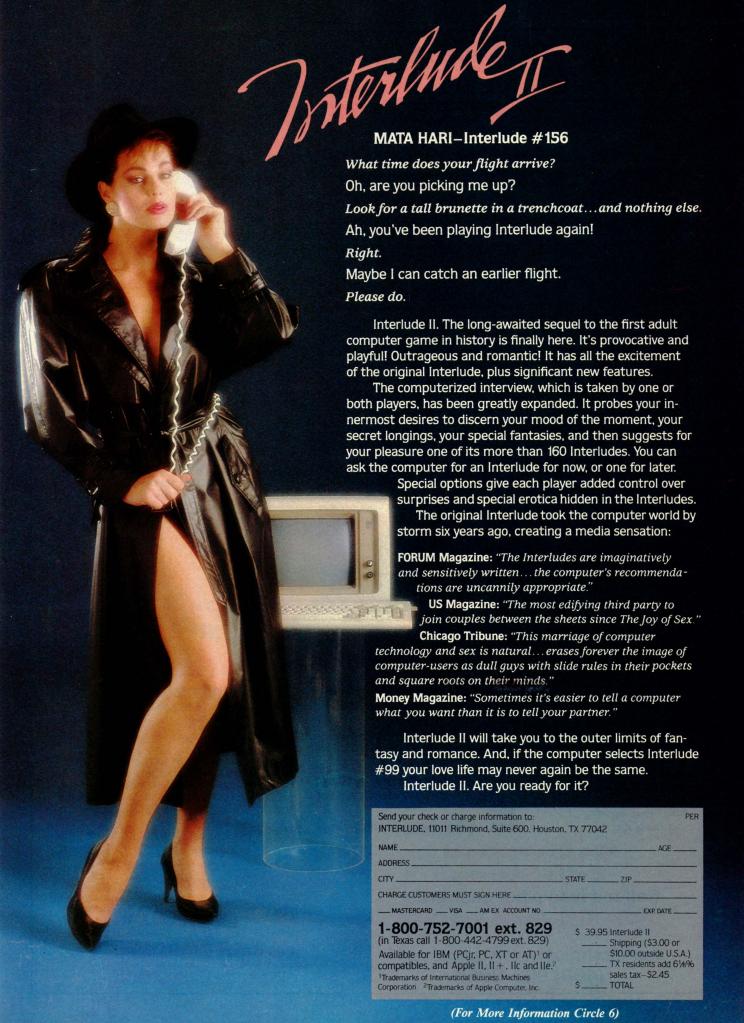
he Reference Set thesaurus and dictionary can be purchased separately or as a set. Neither Reference Set nor Turbo Lightning is copy protected. The full programs for each occupy three disks. Both contain small dictionaries and thesauruses for users who don't run them from a hard disk.

Although we tend to think of these sorts of programs as complements to word processors, both work with other applications, including Lotus 1-2-3 and dBase. Both support expanded memory specifications such as those used by Intel's Above Board. Both claim they get along with other RAM-resident programs, including Borland's SideKick and SuperKey, if you load the programs in the right order. Reference Set also offers access to some DOS commands and stores commonly used phrases or commands in what it calls glossaries and other programs call macros.

Turbo Lightning and Reference Set both can be configured to work with most word processors by reassigning a few keys. You have to run graphic word processors like Microsoft Word 2.0 in character mode to take full advantage of the programs' capabilities.

For people who can't begin to correctly spell words like entrepreneur, fluorescent or echelon, spelling checkers are a blessing. For many of us, software like Reference Set and Turbo Lightning can be indispenseable. Oops. Make that indispensable.

Turbo Lightning is from Borland International, 4585 Scotts Valley Drive, Scotts Valley, CA 95066; (408) 438-8400. Reference Set is a product of Reference Software, 330 Townsend St., No. 232, San Francisco, CA 94107; (415) 947-1000.



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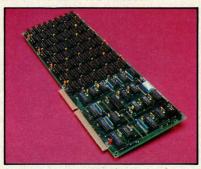
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PRODUCT LISTINGS / Introductions This Month

Compatible Has 20Mb Hard Disk

SYSTEMS

A-2001 is an IBM-compatible personal computer that is available with two 5.25-inch drives, or one 5.25-inch drive and a 20Mb hard disk. Both models use an 8086 processor, and offer 4.77MHz and 7.16MHz clock speeds, parallel and serial ports, 256k of RAM and a 12-inch monochrome monitor. Memory may be increased to 640k, and a 12-inch color monitor is available as an option. Two different keyboard styles are available. The first is an IBM-style keyboard; the second keyboard is designed for word processing applications and is intended for use with CanonWriterII Plus. A mouse can be connected to either keyboard. Canon USA, Systems Division, One Canon Plaza, Lake Success, NY 11042; (516) 488-6700; \$1,995 with two 5.25-inch drives and \$3,595 with 20Mb hard disk, retail. (For additional product details, circle 315 on one of the Free Information Cards.)

THE A*STAR is an IBM AT-compatible personal computer that features a 1.2Mb drive, 6-and 8MHz clock speeds, 512k of RAM, a hard disk and floppy drive adapter, a keyboard and a clock/calendar. Peripherals



The A*Star IBM PC AT-compatible features two clock speeds and a clock/calendar.

available for the A*Star include a 20Mb hard disk (\$449) and a 12-inch monochrome monitor (\$139). Wells American, 3243 Sunset Blvd., West Columbia, SC 29169; (803) 796-7800; \$1,495 direct order. (For additional product details, circle 316 on one of the Free Information Cards.)

THE MBC 675 AND MBC 670-HD20 are IBM-compatible portable computers that weigh approximately 28 pounds. Both feature 256k of RAM; a 4.77MHz clock speed; a built-in, 7-inch monochrome screen; and parallel and serial interfaces. The MBC 675 has two 5.25-inch drives; the MBC 670 has one 5.25-inch drive and a 20Mb hard disk. Sanyo Business Systems Corp., 51 Joseph

St., Moonachie, NJ 07074; (201) 440-9300; \$1,399 for MBC 675, \$2,599 for MBC 670-HD20 retail. (For additional product details, circle 317 on one of the Free Information Cards.)

THE MBC-990 is an IBM AT-compatible personal computer that features 512k of RAM, a floppy and hard disk interface, a 1.2Mb drive, eight expansion slots, and 6- and 8MHz clock speeds. Six of the eight expansion slots are AT-compatible. MS-DOS 3.1 and GW-Basic are also included with the computer. Sanyo Business Systems Corp., 51 Joseph St., Moonachie, NJ 07074; (201) 440-9300; \$2,599 retail. (For additional product details, circle 318 on one of the Free Information Cards.)

THE PC8 has been upgraded to include a 30Mb hard disk. The PC8 is IBM ATcompatible, and operates under the Xenix operating system. It is designed to work as a multiuser/multitasking system or as a network file server. Other features include 512k of RAM and a 1.2Mb drive. Options for the PC8 include a 64Mb internal hard disk (\$3,595), a 3.5-inch drive that is compatible with IBM's recently announced 3.5inch drive (\$190), and a monochrome (\$195) or color (\$695) monitor. NCR Corp., Personal Computer Division, Dayton, OH 45479; (513) 445-7478; \$4,990 retail. (For additional product details, circle 319 on one of the Free Information Cards.)

PERIPHERALS

able to 1.5Mb. Intel Corp., 5200 NE Elam Young Parkway, Mail Stop TOD-07, Hillsboro, OR 97124-6497; (503) 681-8080; \$595 with 128k, \$795 with 512k retail. (For additional product details, circle 320 on one of the Free Information Cards.)

ADAPTMODEM/ACC is a synchronous internal modem for the IBM PC, XT, AT and compatibles. Modem features include auto-dial, auto-answer, automatic redial, and a directory for 180 phone numbers. Network Software Associates, Inc., 22982 Mill Creek, Laguna Hills, CA 92653; (714) 768-4013; \$795 retail. (For additional product details, circle 321 on one of the Free Information Cards.)

BACKUP, a series of tape backup units from Irwin Magnetics, includes several new models. The Model 120 is an internal unit for the IBM XT and AT that has a data transfer rate of 250,000 bits per second and a 20Mb capacity. The Model 145 is an internal unit for the IBM AT that has a data transfer rate of 500,000 bits per second and a 40Mb capacity. Irwin Magnetics, 2311 Green Road, Ann Arbor, MI 48015; (313) 996-3300; \$850 (Model 120) \$995 (Model 145) retail. (For additional product details, circle 322 one of the Free Information Cards.)

BERNOULLI BOX PLUS contains two 20Mb-capacity removable cartridges and an 80Mb hard disk. Bernoulli Box Plus includes Q-DOS, a file management program that enables users to manipulate directories, subdirectories, or individual files and transfer them to cartridges. It also includes IBackup, a backup program that enables the user to perform archiving and cartridge-to-cartridge backup. Iomega Corp., 1821 West 4000 South, Roy, UT 84067; (801) 778-1000; \$5,995 retail. (For additional product details, circle 323 on one of the Free Information Cards.)

color 730 is an RGB color monitor compatible with the Professional Graphics Controller from IBM. The monitor has a maximum pixel resolution of 720 by 480 and displays a maximum of 256 colors from a palette of 4,096 colors. Amdek Corp., 2201 Lively Blvd., Elk Grove Village, IL 60007; (312) 364-1180; \$1,099 retail. (For additional product details, circle 324 on one of the Free Information Cards.)

EGA MASTER is an EGA board for the IBM PC, XT, AT and compatibles. The board provides a 640-by-350-pixel resolution, displays 16 colors from a palette of 64, and has 256k of video RAM. The board emulates CGA and MDA display modes. Tecmar, Inc., 6225 Cochran Road, Solon, OH 44139-3377; (216) 349-0600; \$395 retail. (For additional product details, circle 325 on one of the Free Information Cards.)

EGADS is an EGA board that has a 640-by-350-pixel resolution, a display of 16 colors from a palette of 64, and 256k of video RAM. For the IBM PC, XT and AT, the board emulates CGA and MDA display modes. PC's Limited, 1611 Headway Circle, Building 3, Austin, TX 78754; (512) 339-6800; \$269 retail. (For additional product details, circle 326 on one of the Free Information Cards.)

EVERCOM is a 1200-baud internal modem that fits in the short slot of an IBM XT,

For more product information, please circle the appropriate number on one of the Free Information Cards that are located facing the Product Index within the product review section or opposite the Advertiser's Index.

PRODUCT LISTINGS

Portable Personal Computer or compatible. It features call progress monitoring and automatic switching between voice and data communications. Everex Systems, Inc., 48431 Milmont Drive, Fremont, CA 94539; (415) 498-1111; \$249 retail. (For additional product details, circle 327 on one of the Free Information Cards.)

FILECARD20 is a 20Mb hard disk on a board for the IBM XT and compatibles. It includes an automatic installation program and Xtree file directory management software. Western Digital Enhanced Peripherals, 2445 McCabe Way, Irvine, CA 92714; (714) 863-0102; \$895 retail. (For additional product details, circle 328 on one of the Free Information Cards.)

HC SERIES is a series of internal and external hard disks that provide storage capacities of 82, 115, 150 and 260Mb for the IBM AT. Features of the hard disks include automatic head parking and locking, shock mounting and quiet operation, says the product developer. Core International, 7171 North Federal Highway, Boca Raton, FL 33431; (305) 997-6055; prices range from \$3,995 for 82Mb capacity to \$8,995 for 260Mb capacity, retail. (For additional product details, circle 329 on one of the Free Information Cards.)

INTERBRIDGE is designed to connect several AppleTalk personal networks, enabling users to access networks using the Macintosh 512k and Macintosh Plus personal computers, file servers, LaserWriter, and other peripherals. InterBridge has two AppleTalk connectors and two RS-232 ports. Hayes Microcomputer Products, Inc., PO Box 105203, Atlanta, GA 30348; (404) 449-8791; \$799 retail. (For additional product details, circle 330 on one of the Free Information Cards.)

JETREADER AND JETREADER PLUS are image scanners that feature a 300-dots-per-inch resolution, an automatic document feeder, and software. Both models, which work with the IBM PC, XT and AT, measure 16 inches wide by 10.7 inches deep by 3.4 inches high. Included Optical Character Recognition (OCR) software reads standard office type styles. OCR Plus software, included with the JetReader Plus, can be trained to recognize other 10- or 12-pitch type styles. The Word Image Processing System enables the user to manipulate and manage images. Datacopy, 1215 Terra Bella Ave., Mountain View, CA 94043; (415) 965-7900; \$2,950 for JetReader, \$3,250 for JetReader Plus, retail. (For additional product details, circle 331 on one of the Free Information Cards.)

THE LASERPRO 1510 is a laser printer with a print speed of 15 pages per minute. The LaserPro 1510 has a resolution of 300 by 300 dots per inch, and 20 bit-mapped fonts. In addition, the printer includes a custom font-generation system that enables the user to print any five basic fonts in boldface, italics,

bold italics, and expanded and compressed type. It uses a dual-paper-feed system that provides storage for up to 500 sheets of paper. Office Automation Systems, Inc., 8352 Clairemont Mesa Blvd., San Diego, CA 92111; (619) 576-9500; \$6,995 retail. (For additional product details, circle 344 on one of the Free Information Cards.)

MEGAFUNCTION is a multifunction board for the IBM PC, XT, AT and compatibles that includes 1.25Mb of RAM, a parallel port, a serial port, a clock/calendar, and a RAM disk with an auxiliary power supply. Tecmar, Inc., 6225 Cochran Road, Solon, OH 44139-3377; (216) 349-0600; \$895 retail. (For additional product details, circle 332 on one of the Free Information Cards.)

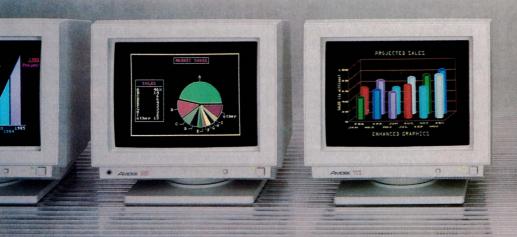
MEMEK is a multifunction board for the IBM PC, XT and compatibles that includes a color graphics adapter; monochrome graphics adapter; and 256k, 1Mb or 2Mb of RAM. Installation and diagnostic software, a RAM disk and a print spooler are included with the board. Boca Research, Inc., 6401 Congress Ave., Boca Raton, FL 33431; (305) 997-6227; \$645 with 256k, retail. (For additional product details, circle 333 on one of the Free Information Cards.)

THE MODEL 7064 is a 14-inch color monitor compatible with EGA and CGA boards. The monitor has a text switch that enables the user to switch to a green display when using word processing software or another

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text-based package. Conrac Division, 600 North Rimsdale Ave., Covina, CA 91722; (818) 966-3511; \$735 retail. (For additional product details, circle 334 on one of the Free Information Cards.)

THE MRB-2000 is an extended memory board for use with the IBM AT and compatibles. It is available with 512k, 1Mb, 1.5Mb or 2Mb of RAM, and is designed to run with multiuser and multitasking setups. Star Gate Technologies, Inc., Suite 109, 33800 Curtis Blvd., Eastlake, OH 44094; (216) 951-5922; \$429 with 512k, direct orders. (For additional product details, circle 335 on one of the Free Information Cards.)

N/HANCE is an optical disk system for the IBM PC, XT, AT and compatibles that provides 230Mb of storage. A 5.25-inch disk drive, controller board and device driver software are included with the optical disk. Data can be written to the optical disk once and then read any number of times. Applications include use with legal files, historical records, health care records, architectural and engineering designs, and other material that does not need to be changed. N/Hance is available in internal and external models. N/Hance Systems, 908R Providence Highway, Dedham, MA 02026; (617) 461-1970; \$3,495 direct order. (For additional product details, circle 336 on one of the Free Information Cards.)

THE P2100 is a dot matrix printer featuring a

print speed of 400 characters per second for draft-quality documents, 200 cps for memoquality documents, and 80 cps for nearletter-quality documents. The printer has an 18-pin print head and is designed to produce high-resolution graphics. Other features include interchangeable font cartridges; print features such as condensed, bold, superscript and subscript type; and a 4k buffer that can be expanded to 256k. ALPS America, 3553 North First St., San Jose, CA 95134; (408) 946-6000; \$1,595 retail. (For additional product details, circle 337 on one of the Free Information Cards.)

PERFECT 10-CPII is a 10Mb hard disk for the Compaq Portable II. The internal unit comes with mounting hardware, cables to connect the hard disk to the Portable II's hard disk controller, and software for formatting the tape. CMS, 401-B West Dyer Road, Santa Ana, CA 92707; (714) 549-9111; \$945 retail. (For additional product details, circle 338 on one of the Free Information Cards.)

PRINTSTATION 260 is a 136-column dot matrix printer that prints in four or seven colors. The maximum print speed in draft mode is 200 characters per second and the maximum speed in near-letter-quality mode is 40 characters per second. Other features include selection of uni- or bidirectional printing, printing in either landscape or portrait mode, and a self-feeding paper feeder

that enables cut sheet paper to be printed without removing continuous forms. Centronics Data Computer Corp., One Wall St., Hudson, NH 03051; (603) 883-0111; \$1,495 retail. (For additional product details, circle 339 on one of the Free Information Cards.)

QUADPORT-XT is a half-size, multifunction board that includes a serial and parallel port and a clock/calendar. Quadram Corp., One Meca Way, Norcross, GA 30093-2918; (404) 923-6666; \$235 retail. (For additional product details, circle 340 on one of the Free Information Cards.)

SUMMAMOUSE is an electronic mouse for the IBM PC, XT, AT and compatibles. Summa-Mouse includes a driver and menu selection system that works with software including Lotus 1-2-3, WordStar and Microsoft Word. The mouse operates on an included 9-by-11 inch pad with a grid pattern. Summagraphics Corp., 777 State St. Extension, Fairfield, CT. 06430; (203) 384-1344; \$119 retail. (For additional product details, circle 341 on one of the Free Information Cards.)

SUPER-EGA AND SUPER-EGA + are two EGA boards for the IBM PC, XT and AT that also provide CGA, Hercules graphics, and MDA emulation. Both boards display 16 colors from a palette of 64, and operate at clock speeds of 4.77MHz, 6MHz, 8MHz and 9MHz. Super-EGA is available with an optional parallel port (\$50). Super-EGA+ comes standard with a parallel port. Genoa

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Systems, 73 E. Trimble Road, San Jose, CA 95131; (408) 945-9720; \$475 for Super-EGA, \$625 for SuperEGA+ retail. (For additional product details, circle 355 on one of the Free Information Cards.)

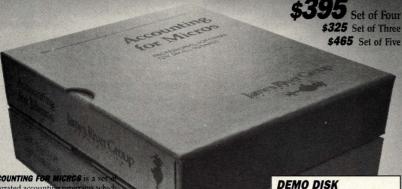
SURPRISE is a board for the IBM PC, XT and compatibles that is designed to increase the computer's speed 2.5 times. The board installs into the 8088 socket on the computer's motherboard. A chip puller is included to

remove the 8088 chip. Maynard Electronics, 460 E. Semoran Blvd., Casselberry, FL 32707; (305) 331-6402; \$249 retail. (For additional product details, circle 342 on one of the Free Information Cards.)

XTEND is a memory upgrade kit for the IBM XT that adds up to 640k of RAM to the computer's memory. Memory is added to the computer by replacing two rows of 64k RAM chips with 256k of RAM, removing a

decoder PROM and installing a programmed replacement chip. The Xtend Multi-Pak kit includes enough decoder and logic chips to upgrade 10 computers. Xtend Plus includes the decoder and logic chips and RAM chips for increasing the memory of one computer. A basic Xtend kit does not include the RAM chips. All three kits come with RAMtest, RAMdisk, and print spooler software, and a chip puller. Multi-Pak includes 10 packages of software and documentation. Vericomp, 8825 Aero Drive, Suite 210, San Diego, CA 92123; (619) 277-0400: \$99 for Multi-Pak and Xtend Plus. \$29.50 for basic kit, retail. (For additional product details, circle 343 on one of the Free Information Cards.)





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MISCELLANEOUS

CLEAN THE MACHINE is a maintenance kit that contains a variety of products for cleaning computer and printer equipment. Among the items included are a print element cleaner for daisywheels, dot matrix print heads and electric typewriter balls; a platen conditioner and cleaner that removes carbon marks, ink and other dirt from the platen; an antistatic cleaner; and nonabrasive cloths for monitor screens and other surfaces. Falcon Safety Products, Inc., 1065 Bristol Road, Mountainside, NJ 07092; (201) 233-5000; \$39.95 retail. (For additional product details, circle 345 on the Free Information Card.)

GLAREBUSTER is a non-glare screen that fastens to the monitor with Velcro strips. The screen is reversible, and is available with a black or putty colored border. Screen Data Corp., 80 South Jefferson Road, Whippany, NJ 07981; (201) 887-7713 in NJ, (800) 248-1212 elsewhere; \$25.95 retail. (For additional product details, circle 346 on one of the Free Information Cards.)

LINE SAVER MODEL 750 is an uninterruptable power supply designed to handle the larger power demands of the IBM AT and compatibles. In addition to providing uninterruptable power, Line Saver has two surgeprotected, EMI/RFI-filtered AC outlets; an audible and visible power failure warning system; test mode indicator and switch; and external fuses. The unit weighs 38 pounds. Kalgo Electronics Co., Inc., Dept. CP, 6584 Ruch Road, E. Allen Twp., Bethlehem, PA 18017; (215) 837-0700; \$995 retail. (For additional product details, circle 347 on one of the Free Information Cards.)

MOBILE MICROMASTER is a computer workstation that includes a storage shelf for holding paper, supplies and peripherals, and a concealed rear section that keeps cables and power cords out of sight. The workstation is 48 inches wide. Options available include a monitor shelf (\$99), side extensions (\$49), supplies drawer (\$49), and a surge protector

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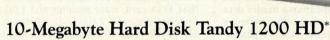


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The 2-disk Tandy 1200 (25-3001) comes with 256K RAM, expandable on board to 640K. A standard parallel interface—an extra-cost option on the IBM—is included. Seven card slots are available for expansion.

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System Overview

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Memory: 256K RAM, expandable to 640K.

Storage: Tandy 1200two 360K floppy drives. Tandy 1200 HD—one 360K floppy and one 10megabyte hard disk.

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PRODUCT LISTINGS

outlet strip (\$99). Inmac, 2465 Augustine Drive, Santa Clara, CA 95054; (800) 547-5444; \$299 retail. (For additional product details, circle 348 on one of the Free Information Cards.)

PROTEUS is a buffer and data switch that enables users to operate two printers or other devices with a parallel port at the same time. The buffer provides 64k or 256k of RAM. Computer Friends, Inc., 6415 SW Canyon Court, Portland, OR 97221; (503) 297-2321; \$199 with 64k and \$299 with 256k retail. (For additional product details, circle 340 on one of the Free Information Cards.)

universal data buffer is available in 64k and 256k versions and includes ports for parallel and serial cables. Inmac, 2465 Augustine Drive, Santa Clara, CA 95054; (800) 547-5444; \$385 with 64k and \$560 with 256k, retail. (For additional product details, circle 349 on one of the Free Information Cards.)

PERFORMANCE

AUTOREF/PRO is designed to automatically create a numbered bibliography from word processing text, and insert the appropriate reference numbers into the manuscript. According to the product developer, the software uses a proprietary algorithm to find citations in the text and retrieves the full bibliographic reference from a master data base. The user selects whether the references are numbered in the order cited or alphabetically. Bibliographies can also be created in name/date (Harvard) format, and in the formats of several professional societies, such as the American Psychological Association. The program requires 128k. Scilab, Inc., Box 614, Guilderland, NY 12084; (518) 355-3363; \$199.95 direct order. (For additional product details, circle 397 on one of the Free Information Cards.)

BACKPAK is a utility for backing up and restoring hard disk data. Hard disk files are copied to floppy disks using the PC's internal disk drive. After the initial backup has been performed, BackPak only copies new files or files that have been modified since the last backup. The program tells the user how many fresh disks are needed for new data, automatically formats these disks, provides a report of new and modified files, and verifies correct copying. Included is 10 Pak, a set of utility programs for viewing, sorting and comparing text files, non-text files and memory. The package requires 256k. California Software Products, Inc., 525 N. Cabrillo Park Drive, Santa Ana, CA 92701; (714) 973-0440; \$175 direct order. (For additional product details, circle 398 on one of the Free Information Cards.)

BEST/AOS is an operating system that enables software written for a Qantel system to run in the PC environment with minimal changes, says Quantel, Inc. Some multiple-module, integrated applications include QMRP, for MRP II manufacturing control; HAL, for hotel management; and QARS, for sophisticated retail accounting. The program requires 360k. MDS Qantel, Inc., 4142

Point Eden Way, Hayward, CA 94545; (415) 887-7777; \$900 retail. (For additional product details, circle 399 on one of the Free Information Cards.)

BYSO PRINT is a typographic package that delivers camera-ready type with a dot matrix printer. According to the product developer, 360 by 360 dots per inch is possible with some 24-pin printers. Available are 79 digitized typefaces, which can be set in any size up to 3-inch-high letters. An unlimited number of typefaces or sizes can be used on one page. Five application formats are provided: two kinds of newsletters, a manual, a letter and an announcement. Four standard typefaces are included, and the user may choose four additional typefaces from the Levien Instrument Co. library. The program requires 256k and can be used with any other software package, and with Toshiba 351 and Epson printers. Levien Instrument Co., Sitlington Hill, PO Box 31, McDowell, VA 24458; (703) 396-3345; \$500 direct order. (For additional product details, circle 400 on one of the Free Information Cards.)

colormagic color-enhancement software works with the IBM Enhanced Graphics Adapter card and any color monitor to increase the number of colors accessible from the 16 pre-selected colors on the IBM EGA to the user's choice of any 16 out of 64 available colors. The program resides underneath applications packages. It requires an IBM EGA card, color monitor and 128k. Lifetree Software, 411 Pacific St., Monterey, CA 93940; (408) 373-4718; \$39.95 retail. (For additional product details, circle 401 on one of the Free Information Cards.)

PBASE TOOLS FOR C: PROGRAMMER'S LIBRARY is a software add-on for dBase III Plus. It includes an engine that links programs written in the C language to dBase III Plus, as well as preprogrammed mathematical, financial, statistical and programming functions to expand dBase. The program requires 256k and dBase III Plus. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; (800) 437-4329; 889.95 retail. (For additional product details, circle 447 on one of the Free Information Cards.)

dBFIND is a multipurpose programming tool for finding bugs in dBase command files. Messages indicate syntax errors so the user need not run his or her entire program to find errors, and generates a cross module as well as single module cross reference. dBFind requires 128k. Software Development Factory, PO Box 1106, Hunt Valley, MD 21030; (301) 666-8129; \$99 retail. (For additional product details, circle 402 on one of the Free Information Cards.)

DECISION MODELING is an add-on package in the Decision Maker's Series for Framework II that enables managers to organize and analyze information for decision making. It creates decision matrices, weighs the conse-

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DIAGRAPH business graphics enables users to create organization charts, forms, flow

charts, diagrams, signs, word charts and presentation aids. Over 2,200 symbols are included, thousands of optional symbols are available, and custom libraries and company logos can be made to order. The program requires 384k. Computer Support Corp., 2215 Midway Road, Carrollton, TX 75006; (214) 661-8960; \$395 retail. (For additional product details, circle 403 on one of the Free Information Cards.)

DRAW is a presentation graphics program that uses Microsoft Windows. It produces word charts, text charts, overhead transparencies, etc. It also has an interface to Lotus 1-2-3 and Symphony so graphs produced by these programs can be loaded into Draw, enhanced, and integrated with other data. The program requires 320k and a graphics adapter. Micrografx, Inc., 1820 N. Greenville Ave., Richardson, TX 75081; (214) 234-1769; \$199 retail. (For additional product details, circle 404 on one of the Free Information Cards.)

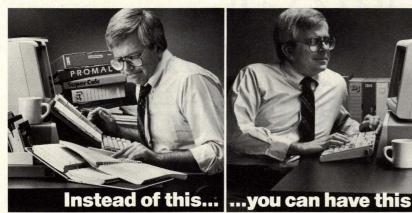
EIGHTY 5 is a 30-minute art program that requires 128k. The program consists of five segments that display the artist's skill and imagination, using the graphic commands on the personal computer. Eighty 5 will be a limited edition of 2,000 disks. Each disk will be numbered and signed, by the artist, to the collector. PC Art, 3101 Oak St., Terre Haute, IN 47803; (812) 235-4185; \$50 direct order. (For additional product details, circle 433 on one of the Free Information Cards.)

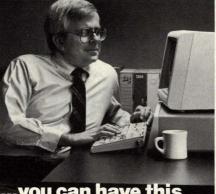
FRAMELOCK encrypts any file that can be read by an IBM PC. It features two levels of security, password protection, and an advanced cipher. The program requires 512k. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; (800) 437-4329; \$39.95 retail. (For additional product details, circle 449 on one of the Free Information Cards.)

THE GREENLEAF COMM LIBRARY is a programmer's tool that supports the C programming language. According to the company, the software provides interrupt-driven, ringbuffered asynchronous communications capability. The package consists of a 150-page, IBM bookcase-style documentation binder, source code, library files for all models of a particular C compiler, support, a newsletter subscription, a reference card, demo programs with source, and access to the firm's bulletin board system. The program requires 64k. Greenleaf Software, Inc., 1411 LeMay Drive, Suite 101, Carrollton, TX 75007; (214) 446-8641; \$185 retail. (For additional product details, circle 403 on one of the Free Information Cards.)

GDSS, or Graphic Decision Support System, is a presentation-level business graphics program for the creation and production of slides, transparencies, printouts and plots. GDSS comes with a business chart creator, called GraffHopper, that contains more than 100 pre-defined chart templates. It was designed as an interface between the company's Multifold Graphics program and General Parametrics' VideoShow graphics package. It requires 320k. Data Business Vision, Inc., 3510 Dunhill St., Suite B, San Diego, CA 92121; (619) 450-1557; \$795 direct order. (For additional product details, circle 404 on one of the Free Information Cards.)

INSTANT MAIL MANAGER communications software supports X.PC error-checking communications protocol, assuring users of Easy-Link and other electronic mail and information services of automatic end-to-end error correction in data transmissions. Instant Mail Manager integrates word processing, address list, file maintenance and communications functions, and requires 384k and







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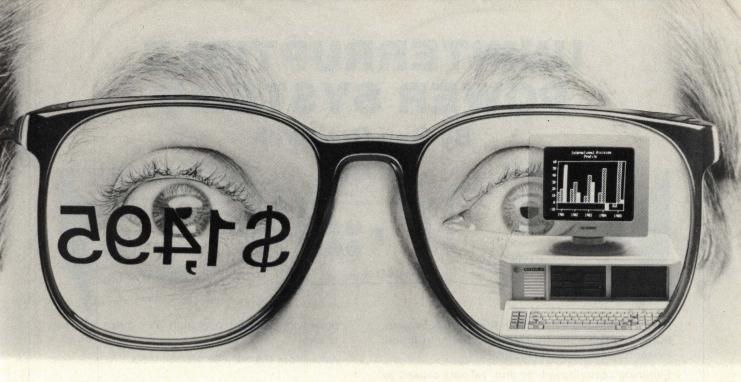
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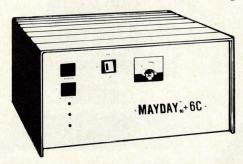


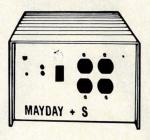
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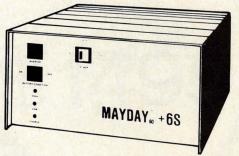
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an asynchronous modem. Western Union, One Lake St., Upper Saddle River, NJ 07458; (201) 825-5000; \$185 retail. (For additional product details, circle 405 on one of the Free Information Cards.)

INTRODUCING DISPLAYWRITE is designed to teach the menus and functions of Display-Write, IBM's word processing program. Through the program's DisplayWrite simulator, users gain hands-on experience with DisplayWrite functions and commands. The program requires 128k. DSI Micro, 770 Broadway, New York, NY 10003-9529; (212) 475-3900; \$149 direct order. (For additional product details, circle 406 on one of the Free Information Cards.)

LABLMAKR PC2 enables the user to print a variety of labels on a standard dot matrix printer. Labels can be printed in 52 different formats, in sizes from 1/2 inch by 2 3/4 inch, up to 8 inches wide. These formats can then be combined to produce different label configurations. The program is menu driven and requires 192k. ETS Center, 35026-A Turtle Trail, Willoughby, OH 44094; (216) 946-8479; \$49 direct order. (For additional product details, circle 407 on one of the Free Information Cards.)

LIST & MAIL is a menu-driven mailing list manager designed for large mailings. It sorts by any field and can print lists on user-defined forms or on pre-defined Avery forms merchandised with the software. The program requires 128k. Business Systems Division, 777 E. Foothill Blvd., Azusa, CA 91702-1358; (818) 969-3311; \$59.95 retail. (For additional product details, circle 408 on one of the Free Information Cards.)

LOCKIT II enables the user of a hard-disk-based personal computer to set up pass-word-protected subdirectories. It is designed to eliminate the need for file encryption to protect data. Passwords may be changed at any time. It requires PC- or MS-DOS 2.0 or greater. Security Microsystems Consultants, 16 Flagg Place, Suite 102, Staten Island, NY 10304; (718) 667-1019; \$79.95 direct order. (For additional product details, circle 409 on one of the Free Information Cards.)

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MASTERSWEEP is a file maintenance utility that enables users to access disk directories/ files; and find, view, copy, print, rename, move, delete, or tag them. Functions can be performed with a single keystroke. The program requires 128k. *The Software Store*, 706 Chippewa Square, Marquette, MI 49855;

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PRODUCT LISTINGS

(906) 228-7622; \$49 direct order. (For additional product details, circle 411 on one of the Free Information Cards.)

MR. BLUE is a file display, search and print program that replaces the single direction, single-line scrolling and line wrapping characteristics of DOS's PRINT and TYPE commands with a full-screen display window. The window measures 23 lines down by 256 positions across. The program requires 36k. Lambid Development, Inc., PO Box 3290, Skokie, IL 60076-6290; (312) 328-4875; \$45 direct order. (For additional product details, circle 412 on one of the Free Information Cards.)

OFFICEGRAPHICS captures the graphic images generated with other programs and incorporates them into documents created with the OfficeWriter word processing program. The user specifies image placement, checks image size, and modifies the images while inside OfficeWriter. The graphic images merged with the document are displayed at print time, alleviating the cutting and pasting process. The program requires 331k, OfficeWriter, and an IBM graphics board or one with compatible graphic modes. Office Solutions, 2802 Coho St., Madison, WI 53713; (608) 274-5047; \$145 retail. (For additional product details, circle 413 on one of the Free Information Cards.)

ONESHOT is a data formatting utility that translates downloaded text files from minicomputers, commercial data bases or mainframe computers into one of seven file formats that can be used by spreadsheet or data base programs. It enables the user to define selection and conversion rules using any portion of a file, applies the rule to the entire file during processing, and permits the necessary data to be selected from a downloaded file. The program requires 128k. Softronics, 7899 Lexington Drive, Suite 210, Colorado Springs, CO 80918; (303) 593-9540; \$195 retail. (For additional product details, circle 414 on one of the Free Information Cards.)

PRINTWORKS FOR LASERS, version 2.1, is a desktop publishing program with 35 memory-resident typesetting functions and additional laser printer support. The program offers pop-up menu selection of laser printer features and Epson MX-80 printer emulation, which provides Hewlett-Packard LaserJet and Canon compatibility. It also features laser printer support for IBM DisplayWrite 3, and for LaserJet 500 Plus, Xerox 4045 Laser CP, and NCR 6416 laser printers. The program requires 256k. Soft-Style, Inc., 7192 Kalanianaole Highway, Suite 205, Honolulu, HI 96825; (808) 396-6368; \$125 retail. (For additional product details, circle 415 on one of the Free Information Cards.)

PROGRAF, a graphics program, enables the user to create standard line, bar, area, pie and text charts, as well as specialized ratio, high-low, decision, organization, PERT, loading, histogram and variance charts. It can combine different charts to compare the same data in a variety of ways, or merge multiple graphs on the same slide. ProGraf also enables users to add freeform graphics



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and text anywhere on a chart. The program requires 192k. Computer Graphics Group, Inc., 568 14th St. NW, Atlanta, GA 30318; (404) 876-9496; \$149 retail. (For additional product details, circle 416 on one of the Free Information Cards.)

PROJECT ANALYSIS is an add-on package in the Decision Maker's Series for Framework II that helps project managers define, organize and plan each step of a new project. The program's "Skills Bank" lists personnel and their special skills for task assignments, and its "Resources Bank" compiles available resources to meet project requirements. The program requires 512k. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; (800) 437-4329; \$69.95 retail. (For additional product details, circle 450 on one of the Free Information Cards.)

QCCP is a quality control charting program for the analysis and interpretation of statistical quality control data. Average (X) and Range (R) charts are commonly used where variables are sampled over a period of time. Using the Central Limit Theorem, control limits can be set and used to determine the status of a process and to uncover reasons for variations in measured data. The program automatically plots X and R charts side by side to minimize errors. The program requires 64k. Kern International, 575 Washington St., Dept. Q1, Pembroke, MA 02359; (617) 826-0095; \$95 direct order. (For

additional product details, circle 417 on one of the Free Information Cards.)

SALT & PEPPER is a utility designed for Basic programmers. The package has 29 subroutines that are saved in ASCII format. Once they are merged into a program, these subroutines enable the user to create menus and input screens, process dates, change strings to upper- or lowercase, create "walking" strings, trap errors, and issue caps lock on/ off and print screen commands. The program requires 9k. Computer Guru, 40 Wagner Ave., Piscataway, NJ 08854; (201) 356-6477; \$59.95 direct order. (For additional product details, circle 418 on one of the Free Information Cards.)

SECRETDISK, a data encryption system, provides security for sensitive information such as salaries or customer lists. It is loaded as a disk driver by MS-DOS and creates new DOS drives on a floppy or hard disk. The program requires 128k. Lattice, Inc., PO Box 3072, Glen Ellyn, IL 60138; (312) 858-7950; \$59.95 direct order. (For additional product details, circle 419 on one of the Free Information Cards.)

SHOW PARTNER is a graphics package that combines animation capabilities; a slideshow manager; and Grafix Partner, a RAMresident graphics editor. It can replace one image with another; perform "wipe," "split," "box" and "scroll" effects in varied directions; "fade-in" a selected area, and "weave" an area. The user can edit screens while developing a script, add custom sound effects, and pause a self-running show. Show Partner supports IBM CGA and EGA displays, AST ColorGraphPlus augmented palette display, AST Preview, Herculescompatible monochrome graphics adapters, and the AST RAMpage EMS standard. The program requires 256k. Brightbill-Roberts, 120 E. Washington, Suite 421, Syracuse, NY 13202; (315) 474-3400; \$149 retail. (For additional product details, circle 420 on one of the Free Information Cards.)

SIDETALK, a pop-up telecommunications package, connects a user with his modem from inside any application with a single keystroke. It also includes the SideTalk Communications Language of Basic-like commands that enables users to create their own communications processing systems. Side-Talk requires 64k. Lattice, Inc., PO Box 3072, Glen Ellyn, IL 60138; (312) 858-7950; \$119.95 direct order. (For additional product details, circle 451 on one of the Free Information Cards.)

SQZ is a utility for Lotus 1-2-3 worksheet files that is designed to transparently compact and expand worksheets 80 to 95 percent during loading and saving to disk. The degree of compaction varies per file; generally, the larger the file, the higher percentage of compaction, says the product developer. The developer further claims that the pro-



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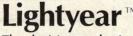
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PRODUCT LISTINGS

gram also reduces retrieve/save time and cuts the cost of sending files electronically; a 150k file at 1200 baud that takes 20 minutes to transmit should take three when compacted with SQZ. It requires 30k and is memory-resident. Turner Hall Publishing, 10201 Torre Ave., Cupertino, CA 95014; (408) 253-9607; \$79.95 direct order. (For additional product details, circle 421 on one of the Free Information Cards.)

SYON is a graphics program that offers users a choice of 11 graph types, provides integration of text and graphs, and has pictograph symbols that can be created for business reports. The program requires 256k. Stella Systems, 10430 S. DeAnza Blvd., Suite 185, Cupertino, CA 95014; (408) 257-6644; \$199 retail. (For additional product details, circle 422 on one of the Free Information Cards.)

SYSTEM BUILDER is a program generator that enables the user to paint screens and define data files on-screen; the program then automatically produces the program code and builds a data base. System Builder requires 256k. Royal American Technologies, 201 Sansome St., Suite 500, San Francisco, CA 94104; \$99.95 direct order. (For additional product details, circle 423 on one of the Free Information Cards.)

TIMEFRAME is a desktop utility for Framework and Framework II that includes an appointment book, calendar, calculator, and office assistant. The office assistant contains a directory, letter writer, and mail merge labels. The program requires 512k. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; (800) 437-4329; \$39.95 retail. (For additional product details, circle 452 on one of the Free Information Cards.)

TRAINER TURNED AUTHOR is a courseware authoring system available in Starter Series, Intermediate Series and Expert Series. It enables the non-programmer to create tutorials or training courses on any subject. The author may mix text, graphics and questions on a page. Features include word processing screen entry, built-in drawing systems, student record keeping, and page editing with playback. The program requires 256k. Raster Technology, Inc., PO Box 3477, 283 Hunter's Point, Longwood, FL 32770; (305) 862-2859; \$119 (Starter), \$299 (Intermediate) and \$485 (Expert), direct order. (For additional product details, circle 424 on one of the Free Information Cards.)

TYPER is designed to turn a personal computer into a memory typewriter for jobs, such as typing envelopes and Rolodex cards, that are inappropriate for a word processing program. Typer requires 64k. Alpha Merics, Inc., 1623 South 21 St., Hollywood, FL 33020; (305) 949-8318; \$79.95 retail. (For additional product details, circle 425 on one of the Free Information Cards.)

wisard is a forecasting program that its developer says is appropriate for sales, marketing, manufacturing, etc., and requires no knowledge of statistics to learn or use. Once the user inputs time series data, the program uses an artificial intelligence approach to select optimal parameters automatically for several time series forecasting techniques.

The program requires 256k. Shade Information Systems, PO Box 19730, Green Bay, WI 54307; (414) 432-6700; \$395 introductory price until July 30, direct order. (For additional product details, circle 426 on one of the Free Information Cards.)

PRODUCTIVITY

ABLE ONE is an integrated package that has word processing, spreadsheet, data base, telecommunications and graphics capabilities. Data created in one application can be used in any of the other applications. The program's developer says the package can manage several tasks simultaneously. The memory requirement is 512k. Able International, 301 N. Main St., Suite 303, Pueblo, CO 81003; (303) 544-9600; \$84.95 retail. (For additional product details, circle 365 on one of the Free Information Cards.)

ACCOUNTS PAYABLES MODULE is a standalone payables program that handles up to 300 customers and 300 invoices per floppy disk, and up to one billion customers and invoices. It supports check writing and register, mailing labels, vendor and aging reports, two levels of password protection, open purchase orders, customized reports (more than 100), partial payments, seven optional billing cycles, and automatic purchasing for standing orders. The program is one in a series of "Small Business CPA" programs and requires 384k. Calvert Computer Systems, Inc., 240 E. Main, Box 95, Athena, OR 97813; (503) 566-3338; \$295 retail. (For additional product details, circle 366 on one of the Free Information Cards.)

APOLLO is a data base that its developers claim is more than 50 times faster than dBase III. In addition, the program does not require that the user learn a language or command phrases. It is designed to retrieve, print, remove, transfer, or write to a text file any record or selected group of records. Any file field may contain a formula, and spreadsheets may be created. Data can be transferred to and from spreadsheets and word processors. The program requires 128k. Schmidt Enterprises, 7448 Newcastle Ave., Reseda, CA 91335; (818) 342-5930; \$250 retail. (For additional product details, circle 367 on one of the Free Information Cards.)

BALANCE is an integrated, menu-driven accounting system with six modules: sales order entry, inventory control, accounts payable, accounts receivable, general ledger and financial reporter. A module can be used as a stand-alone package or as part of the integrated unit. Additional add-on modules include bill of materials, sales lead management, client time and billing, job costing, point of sale, and payroll. The program requires 128k. Royal American Technologies, 201 Sansome St., Suite 500, San Francisco, CA 94101; (415) 397-7500; \$99.95 retail. (For additional product details, circle 368 on one of the Free Information Cards.)

BENCHMARK MAIL LIST, a mailing list manager, has editing capabilities; list entry scanning; selective merging by criteria; 14 data fields; two, 40-character reference fields; and sorting by field. It also includes the Benchmark Administrator, a master menu directory program that loads the Mail List and other programs, allowing the use of command, batch, execute files and operating system utilities from a central menu. The program requires 256k. Metasoft Corp., 6509 W. Frye Road, Suite 12, Chandler, AZ 85226; (602) 961-0003; \$99 retail. (For additional product details, circle 369 on one of the Free Information Cards.)

CASHTRACK is a home accounting system designed to track income, expenses, assets and liabilities. It features menu selections, screen instructions, a "tree structure" for account categories, reports for accounts, cash flow, and cash projections. According to its developer, CashTrack keeps up to 10 years worth of data on a single disk. It requires 128k. Sublogic Corp., 713 Edgebrook Drive, Champaign, IL 61820; (800) 637-4983; \$149 plus \$4.50 direct order. (For additional product details, circle 370 on one of the Free Information Cards.)

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essing with personnel management and can be used as a stand-alone module or integrated with Easy Accounting. It has federal and state tax tables; federal, state and city withholding calculations; FICA; FUTA; SUTA; State Disability Insurance Fund; and up to seven user-defined deductions per employee. It is designed to handle an unlimited number of employees and requires 128k. Dac Software, 4801 Spring Valley

Road, Building 110 B, Dallas, TX 75244; (800) 992-7779; \$49.95 plus \$7.50 postage and handling. (For additional product details, circle 371 on one of the Free Information Cards.)

ERIC-II, or Employee Records and Information Computerized, is an analytical tool for human resource management that handles 50 to 3,000 employees. It provides cost/information analysis and projection and

contains sections on affirmative action, employment, employee relations, employee health and welfare, records and employee demographics, and labor relations. The system supports merit and union jobs, up to 999,999 job numbers, 999,999 cost centers, five organizational reporting levels, five levels of data security, and 999 benefit plans with up to five contribution factors per plan. The program requires 256k and a 10Mb hard disk. Human Management Systems, Inc., 12828 Northup Way, Suite 200, Bellevue, WA 98005; (206) 881-2074; \$995 direct order. (For additional product details, circle 372 on one of the Free Information Cards.)

EQUIPD manages the equipment purchased, leased or rented by corporations, schools and other organizations. The system has help screens; provides menu-driven facilities for entering, modifying and sorting equipment information; and generates summary and configuration reports. It requires 128k. Berkshire Software Company, 72-61 113th St., Suite 5K, Forest Hills, NY 11375; (718) 263-1221; \$195 direct order. (For additional product details, circle 373 on one of the Free Information Cards.)

FASTPAK PROMAIL is designed for active business mailers with lists in the 5,000- to 6,000- item range. It includes many of the features of FastPak Mail from the same company, but uses keysorting to handle larger lists, has a more sophisticated duplicate elimination feature, provides Zip codes, and more. The program requires 128k. DHA Systems and Software, 832 Jury Court, San Jose, CA 95112; (800) 327-8725; \$159 direct order. (For additional product details, circle 374 on one of the Free Information Cards.)

FILEPLAN, a sales management data base, is designed to print letters, envelopes and mailing labels; customize and personalize form letters; and manage follow-up schedules. Simultaneously, it tracks call reports and telephone logs, quota goals and commissions, and expense reporting and tickler systems. The program features both spreadsheet and forms modes, color-coding to highlight key customers, and compatibility with dBase III and Chang Labs' Rags to Riches accounting software. FilePlan requires 256k. Chang Labs, 5300 Stevens Creek Blvd., San Jose, CA 95129; (408) 246-8020; \$199.95 retail. (For additional product details, circle 375 on one of the Free Information Cards.)

IT FIGURES enables users to design worksheets that solve mathematical problems using a preformatted three-column, 20-line design. Formulas are used to define variables and constants; related calculations are handled automatically and optional comments can be used to track the activity taking place on the worksheet. Formulas, calculations and comments are displayed on the single screen worksheet. Features include line and screen editing, access to on-screen help and menus, the ability to define local and global variables, and preprogrammed scientific-exponential notation and trigonometric functions. The program requires 128k. Simpl-Soft Products, Inc., 5330 Sterling Drive, Suite C, Boulder, CO 80301; (303) 444-8771;

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KYSS is a management package for singleuser PCs or local area networks. It includes a menu generator, extended DOS batch processing capabilities, simplified disk management, job tracking and a text display facility for preparing on-line instructions. This program is an extended version of the Organizer II Universal Operator Interface, and, according to its publishers, is nonresident and cannot interfere with memory organization. The program requires 128k. The Information People, 443 Hudson Ave., Newark, OH 43055; (614) 349-8644; \$150 for single-user systems and starting at \$300 (six users) for networks, retail. (For additional product details, circle 377 on one of the Free Information Cards.)

MUNIS is a municipal/nonprofit package that includes the following modules: Multi-Fund General Ledger and Budgeting, Purchase Orders with Encumbrances, Accounts Payable, Payroll, and Receivables/Cash Receipts. Optional modules are: Water/Sewer Billing, Property Tax Billing, and Voter Lists. The user-definable general ledger account structure supports up to 24 positions and seven segments. Additional features include a purchase order module, multiple cash accounts and the use of subsidiary ledgers and control accounts. Each module is separately priced. The program requires 512k. The Computer Center, 366 US Route One, Falmouth, ME 04105; (207) 781-2260; \$3,000 to \$10,000 depending on choice of modules. (For additional product details, circle 378 on one of the Free Information Cards.)

NEWINT is a loan amortization and analysis program for accountants, lawyers, real estate brokers, bankers, investors, homeowners and consumers. The program displays or prints loan information such as accrued interest, principal paid, and remaining balance as of any date for loans ranging from one day to 50 years in length. The user may structure loans with "creative financing options" such as multiple interest rate changes, different types of payments, or additional payments to principal. The program also solves for unknown loan variables and enables the user to select from a series of reporting formats and printing options. It requires 256k. Bridge Software, Ltd., 316 Brick & Tile Bldg., Mason City, IA 50401; (515) 424-6591; \$95 retail. (For additional product details, circle 387 on one of the Free Information Cards.)

NEWWORD 3 adds such new features to the NewWord word processor as spell checking while editing, keyboard macros, indexing of documents, up to 10 tables of contents, row and column summing, a calculator mode, merge print math and formatting control,

For more product information, please circle the appropriate number on one of the Free Information Cards that are located facing the Product Index within the product review section or opposite the Advertiser's Index. file path support, and multiuser and network support. NewWord's commands and menu screens are nearly identical to WordStar. The program requires 128k. Newstar Software, Inc., 3351 Vincent Road., Pleasant Hill, CA 94523; (415) 930-9400; \$349 retail. (For additional product details, circle 379 on one of the Free Information Cards.)

PARAGON is an accounting package for use in

small- to medium-size businesses. It includes general ledger, accounts receivable, accounts payable, payroll, invoicing, inventory, job cost, sales analysis, and 1099's. The program requires 256k and a 10Mb hard disk. Pyramid Data, Ltd., 1050 W. Katella, Suite A, Orange, CA 92667; (714) 639-1527; \$995 retail. (For additional product details, circle 380 on one of the Free Information Cards.)



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PROFIT PLANNING is designed to improve managers' skills in planning and predicting future financial performance. It introduces the basic terminology and processes used to set and attain financial goals. Examples of topics covered include: procedures used for developing budgets; use of budgets in planning; controlling and motivating performance; need for, and use of, data in making reliable cost projections; key formulas used to plan financial performance; and common problems in developing and maintaining budgets. The program requires 128k. DSI Micro, Inc., 770 Broadway, New York, NY 10003-9529; (212) 475-3900; \$99.95 direct

order. (For additional product details, circle 382 on one of the Free Information Cards.)

POSSE-VT law enforcement software automates dispatching, records management, crime analysis, traffic accident reporting, and master name and vehicle indexing. It is designed around a networked data structure so people, events and property can be linked through a set of options displayed on the screen. The program was designed to automate the reporting process by providing Uniform Crime Reports and workload statistics as a by-product of on-line data entry. The program requires 640k. Vision Technology, 1760 Reston Ave., Suite 415, Reston, VA 22090; (703) 689-0001; \$5500 direct order. (For additional product details, circle 383 on one of the Free Information Cards.)

REALOFFER is designed to show the best possible price for rental property, both from the buyer's and the seller's point of view, using varying rates of interest, mortgage terms and prices. The program requires 128k. Midwest Data Systems, PO Box 3901, Springfield, MO 65808; (417) 887-9324; \$24.95 direct order. (For additional product details, circle 385 on one of the Free Information Cards.)

SCHOOL LEDGER REPORT SYSTEM is an activity fund accounting and report generation package that handles up to 99 accounts and up to 495 sub-accounts. It prints monthly overall transaction reports, fund transfer reports, account reports and summary reports, and year-to-date account reports and summary reports. The School Ledger Report System requires 128k. Shenandoah Software, PO Box 776, Harrisonburg, VA 22801; (703) 433-9485; \$179 direct order. (For additional product details, circle 386 on one of the Free Information Cards.)

SMART SOFTWARE SYSTEM is an integrated business package now available for local area networks. It includes the applications of the 3.0 single-user version, which are: data management, spreadsheet, graphics, word processing, communications, time management, and an 80,000-word spelling checker. The system also has the Smart Programming Language, for applications development using procedural language commands, debugging commands, etc. The program requires 320k and DOS 3.1. Innovative Software, 9875 Widmer Road, Lenexa, KS 66215; (913) 492-3800; \$1,795 retail. (For additional product details, circle 388 on one of the Free Information Cards.)

solo is an investment and portfolio analysis system designed for the individual. A portfolio may include a home, other real estate, money market funds, limited partnerships, mutual funds, a stock portfolio, a bond portfolio, leases, paintings or other investments. SOLO calculates the after-tax rate of return and net present value on specific investments for the portfolio. The program also

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TAXPERTISE, a 1985/1986 tax comparison and planning template for Lotus 1-2-3, is menu driven and includes income averaging, 10-year averaging for lump-sum distributions, a withholding planner and an IRA planner. Results of 10-year averaging can be printed directly on IRS form 4972. The program requires 256k. Marnoble Software, Inc., PO Box 740468, Houston, TX 77274; (713) 662-8466; \$49.95 direct order. (For additional product details, circle 390 on one of the Free Information Cards.)

TCS ACCOUNTING SYSTEM for small businesses includes general ledger, accounts receivable, accounts payable and inventory systems. Modules are integrated but can stand alone. The program requires 256k. TCS Software, Inc., 6100 Hillcroft, Suite 600, Houston, TX 77081; (800) 231-6454; \$495 retail. (For additional product details, circle 396 on one of the Free Information Cards.)

TCS PURCHASING is a new module in the TĆS Total Accounting System for businesses that purchase inventory for resale. The program prints complete purchase orders with standard and custom messages and multiple item capabilities; tracks which items were ordered so their receipt can be marked; and provides reports to help users spot discrepancies. It can function alone or in conjunction with other TCS programs in single- or multiuser environments. It requires 256k. TCS Software, 6100 Hillcroft, Suite 600, Houston, TX 77081; (800) 392-5973; \$795 retail. (For additional product details, circle 391 on one of the Free Information Cards.)

TESTPAL II is an item analysis program for teachers and administrators who develop and use tests. It computes test scores and evaluates test items on their ability to separate better from poorer students. Features include an on-disk tutorial, a QuickEntry system for creation of answer keys and student response files, and a file index manager. The program requires 256k. CompuPal, 9356 Hunters Creek, Dallas, TX 75243; (214) 341-8925; \$40. (For additional product details, circle 392 on one of the Free Information Cards.)

TM/1 tables manager, release 2.0, is designed for high-end users involved with financial analysis and budgeting, market research and sales analysis, industry analysis, and corporate planning. According to the program developer, version 2.0 features network support, expanded documentation, and enhanced analytical capabilities. TM/1 also includes an application development language. It requires 256k. Sinper Corp., 8901 Tonnelle Ave., North Bergen, NJ 07047; (201) 662-7999; \$795 direct order. (For additional product details, circle 393 on one of the Free Information Cards.)

TO-DO-LIST is for managers who have operational, project or planning responsibilities and must prioritize their tasks. The list sorts tasks alphabetically by start date, duration, completion date and priority. Error messages are written to the screen when they are encountered. The program requires 128k. Lawco, Ltd., Dept. PR, PO Box 2009, Manteca, CA 95336; (209) 239-6006; \$24.88 plus \$5 shipping and handling. (For additional product details, circle 394 on one of the Free Information Cards.)

TRUSTMASTER drafts trust documents for attorneys. It contains prototype trust forms for more than 12 common estate plans, optional provisions common to different kinds of trusts, and room to add original material. The user gathers information from the client and decides which kind of trust is called for with the preprinted Trustmaster Information Sheet, and then checks off additional clauses from a list on the corresponding selection sheet. The program requires 256k. California Continuing Education of the Bar, 2300 Shattuck Ave., Berkeley, CA 94704; (415) 642-7590; \$475 direct order. (For additional product details, circle 395 on one of the Free Information Cards.)

LEISURE

ALGEBRA DRILL & PRACTICE I has a supply of sample problems and their solutions for students in beginning algebra. It requires 128k. Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 353-5789; \$125 direct order. (For additional product details, circle 427 on one of the Free Information Cards.)

BIFS: BASICS IN FORECASTING provides an introduction to the basics of population and economic forecasting. It can help students make forecasts through a number of different models similar to ones in actual use by government and corporate officials. The program requires 192k. Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 353-5789; \$75 direct order. (For additional product details, circle 428 on one of the Free Information Cards.)

BIZNES is a simulation designed to help students better understand the economic theory of a company. Decisions about capital, labor and price are entered, and the program reports results—for example, how much the firm will produce, how much it will sell, and whether it will make a profit. It requires 128k. Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 353-5789; \$65 direct order. (For additional product details, circle 429 on one of the Free Information Cards.)

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10 dictations each. Camus requires 128k. Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 353-5789; \$150 for all four disks or \$50 each, direct order. (For additional product details, circle 430 on one of the Free Information Cards.)

catgen, an open-ended simulation designed to act as a vehicle for investigations in genetics, enables students to mate domestic cats of known genotypes. Students define genotypes by specifying up to six gene loci affecting coat color and pattern, and the program produces genetically valid litters of kittens. The memory requirement is 128k. Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 353-5789; \$75 direct order. (For additional product details, circle 431 on one of the Free Information Cards.)

CONFLICT IN VIETNAM is a strategic simulation of the crucial battles of the Vietnam War. Five games chronicle pivotal events from 1954 to 1972 and three battles illustrate various stages of intense American involvement (Ia Drang, 1965; Khe Sanh, 1968; and Cambodia, 1970). Commands entered via joystick or keyboard direct the constantly moving armies as they fight across a scrolling map. One player may choose the North Vietnamese or American side and challenge the computer, or two players can compete. The program requires 128k. MicroProse Software, 120 Lakefront Drive, Hunt Valley, MD 21030; (301) 667-1151; \$39.95 retail. (For additional product details, circle 432 on one of the Free Information Cards.)

provides an introduction to trigonometric functions and their graphs. It was designed to help students understand amplitude, period, and phase shift, and how different parts of trigometric equations affect their graphs. The program requires 128k. Conduit, The University of Iowa, Oakdale Campus, Iowa City, IA 52242; (319) 353-5789; \$75 direct order. (For additional product details, circle 433 on one of the Free Information Cards.)

game for two to four players, ages 14 to adult. As a dog living in the city of Fooblitzky, you roam the streets and shops to find and obtain the four objects needed to win the game. Victory depends on how well you use funds, keep records, and outsmart your fellow players. Since the four secret items change each time you play, no two games are alike. The program requires 128k and a graphics card. Infocom, Inc., 125 Cambridge Park Drive, Cambridge, MA 02140; (617) 492-6000; \$39.95 retail. (For additional product details, circle 434 on one of the Free Information Cards.)

GREEN GLOBS AND GRAPHING EQUATIONS is a high school mathematics package consisting of two programs in game format, Green Globs and Tracker, and two graphing utilities, Linear and Quadratic Graphs and Equation Plotter. Green Globs challenges students to write equations for graphs that will hit as many "green globs" as possible scattered on the grid. In Tracker, graphs of

three or more equations are hidden in the grid. Players send out "probes" to discover points on the graphs, and type in a "tracker," an equation to match one of the hidden graphs, when they have gathered enough clues. Linear and Quadratic Graphs is a practice program focusing on linear and quadratic relations, and Equation Plotter is a practice program and demonstration tool that plots linear and quadratic equations as well as square roots, absolute values, exponential logarithms and trigonometric functions. The package requires 128k. Sunburst Communications, Inc., 39 Washington Ave., Pleasantville, NY 10570; (800) 431-1934; \$59 direct order. (For additional product details, circle 435 on one of the Free Information Cards.)

MIND MIRROR is a mental awareness program designed by Dr. Timothy Leary. After selecting a subject to scrutinize, the user is invited to rate the subject on a series of sevenpoint scales. The program then summarizes the results and presents them in the form of a "mind map," a graphical presentation that allows direct comparison between different subjects. In the part of the program called Life Simulations, the user is asked to respond to a series of situations through the eyes of the subject rated. The program requires 128k. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171; \$34.95 retail. (For additional product details, circle 437 on one of the Free Information Cards.)

PAR 5 is a menu-driven program for golfers that automatically adjusts scores and computes handicaps according to United States Golf Association rules. It also generates statistics such as: the average score on a given course, averages for the number of drives in the fairway, the number of putts, the number of birdies, etc., and graphs that show trends for the last 20 rounds. The program requires 128k. BL&S Enterprises, PO Box 27538, San Diego, CA 92128; (619) 485-9268; \$49 direct order. (For additional product details, circle 440 on one of the Free Information Cards.)

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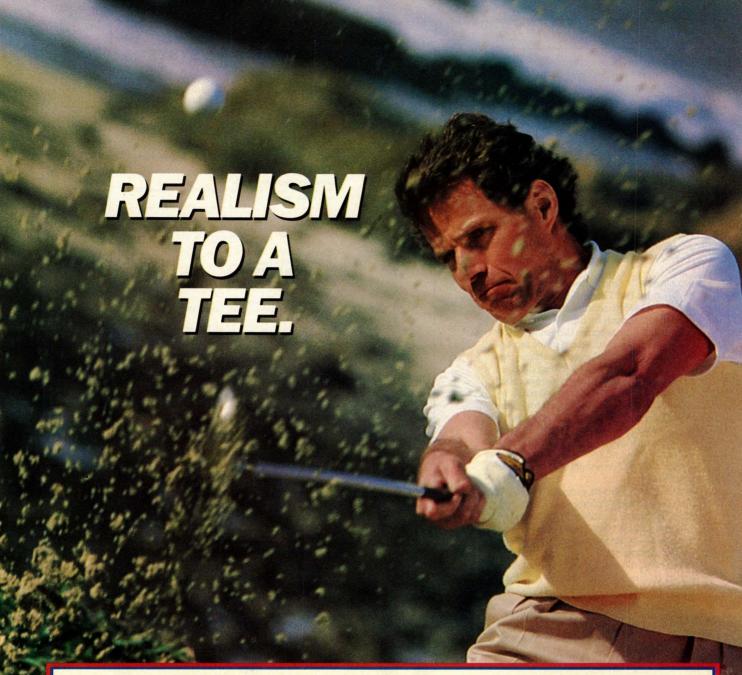
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ANSWERS / This Month's Queries From Our Readers

Checking For IBM PC Compatibility

Q: Is there some way to determine if a personal computer is fully compatible with the IBM PC before buying the machine?

A: There are no sure-fire methods for testing compatibility between personal computers, but following these guidelines once inside the computer store may help:

First, check all the computer's vital signs. Ask questions like: Does it use the same Intel 8088 microprocessor as the IBM PC? Does it run at the same 4.77 megahertz clock speed? Is it designed to run under the MS-DOS operating system? Does it use the same 5.25-inch disk drives with a capacity of 360k bytes? Is the keyboard layout similar? Does it have expansion slots that can accommodate a full-length expansion card? Can it use IBM-type monitors? Not all of the answers need be affirmative to maintain a high degree of compatibility, but you should understand how any differences between a computer and its IBM counterpart might affect compatibility.

Second, try running IBM's PC-DOS operating system, or have the dealer do so for you. If the computer can run PC-DOS, in addition to its own version of MS-DOS, then the system is probably adhering closely to IBM's special input-output routines—a good sign.

Third, try some popular applications software. Ask the dealer to demonstrate the IBM PC version of programs like Lotus 1-2-3, dBase III, WordPerfect and Flight Simulator. If fully compatible, the computer should be able to run almost any popular program right off the shelf. In addition, have the dealer demonstrate programs that others at your workplace use; you may end up using the same software. Of course, check out any programs you have already decided that you want to use.

Fourth, try a few expansion boards on for size. Ask the dealer to show you a computer of the same brand using a variety of expansion cards, perhaps including a multifunction board, an internal modem and a color display card. Popular expansion cards like those from IBM, AST, Hayes, Intel and Hercules

SHORTCUTS

Jumping Into Sub-Directories

ard disk users know all too well how unwieldy storing hundreds of files can become. The multi-level directory system that MS-DOS uses can tuck files into smaller compartments, but sub-directories that give rise to further sub-directories make maneuvering through these files more difficult. Simple batch files can help cut through several levels of sub-directories to locate and view data files.

A typical sub-directory called wordproc might contain program files for a word processing package and four sub-directories of its own to hold documents: LETTER, CONTRACT, REPORT and MEMO. Getting a look at the report files, for example, would normally entail an awkward two-step process that changes the active directory (CD\WORDPROC\REPORT) and lists its contents (DIR). These two commands can be combined into a single directive using a batch file called REPORT.BAT. Try putting these commands into a batch file with the COPY CON command:

C>COPY CON REPORT.BAT CD\WORDPROC\REPORT DIR/P

This batch file changes the active directory and presents a directory of files, pausing (P) at each screenful of characters. The 'Z symbol (Control-Z or F6) is the DOS "end-of-file" marker, signaling that you're finished creating the batch file. With a little polish, this batch file can present an even clearer picture:

C>COPY CON REPORT.BAT ECHO OFF CLS CD\WORDPROC\REPORT DIR:SORT:MORE 72

This batch file first represses the display of batch commands (ECHO OFF) and clears the screen (CLS). It then changes the active directory as before and presents an alphabetically sorted (SORT) list of files, pausing at each full screen (MORE) until you strike any key. Expanding a batch file makes it work slower, but you get better results from one command.

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should work in any computer that is fully compatible.

Last, get a reference. Ask the dealer to give you the name of someone who is using the computer you are interested in, preferably someone who is in a similar line of work. Give that person a call and ask about compatibility problems.

Q: Why are the print speeds of laser printers measured in pages per minute and not in characters per second, as other printers are?

A: The reason is because laser printers put the entire contents of a page onto the paper at once, much the same way a copying machine does. Daisywheel, dot

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RONLIN Research Inc.

Double Entry is a trademark of RONLIN Research, Inc. PC/XT and AT are trademarks of IBM Corporation. Systems Plus is a trademark of Systems Plus Inc. matrix, thermal and ink jet printers form one character at a time. Most page printers have a print speed of eight or 10 pages per minute, while other types of printers have widely differing print speeds. This is because the print speed of a page printer is largely a function of the printer's engine, and only a few different engine types are used in page printers. Other printers use various printing techniques, and this is what causes the wide range of speeds. A daisywheel printer, using the same printing method as a typewriter, generally does not print at more than 40 characters per second, while certain dot matrix printers can print 300 characters per second using a print head of nine or 24 pins to deliver ink to the page.

Page printers and printers that generate one character at a time have one thing in common: The print speeds are often deceiving. Listed speeds of printers are the maximum speed you can hope to get. When printing charts, or a page with several different type styles, for example, printers will be much slower than advertised.

Q: I use dBase III, which can create a bar chart on the screen and then send it to the printer. But the Epson MX80III printer I have does not print the graphics characters sent by dBase III. I have tried using GRAPHICS.COM (the MS-DOS graphics command) before running the dBase III program, but the Epson printer still doesn't print the graphics characters. What can I do?

A: Unlike many other programs that allow you to create bar charts, dBase III uses the predefined graphics symbols in the IBM version of the ASCII character set, rather than dot-addressable graphics. Unfortunately, the Epson MX80III printer does not fully support this version of the ASCII code. There are 256 ASCII characters, but only the first 128 characters are standard-used for the normal text, number and symbol characters you find on a keyboard. The other 128 characters are not standard. IBM uses this set of 128 characters primarily for graphics. Epson decided to use that set of characters primarily for italics. There is no way to upgrade the

If you have questions dealing with hardware, software or applications, PERSONAL COMPUTING will answer them in this monthly column. Please send your "needto-knows" to Answers, PERSONAL COMPUTING, 10 Mulholland Drive, Hasbrouck Heights, NJ 07604.

printer. Therefore, your only choices are to buy a new printer, which will also update your system, or look for a graphics program that can accept data from dBase III.

Q: I have often read in computer magazines that CP/M has a "huge" software base. Like the lost city of Atlantis, it's supposedly there, but nobody seems to know precisely how to find it! I have an Epson PX/8 for traveling and a NEC 8801A for desk use. The latter, in particular, isn't living up to hopes, simply because the software is hiding somewhere. Are there any catalogues that can tell me where to find CP/M software?

A: Two catalogues currently in print are "CP/M Software Finder," published by Que Corp. of Indianapolis, Ind., whose number is (317) 842-7162, and "CP/M Software Review," published by Reston Publishing Co., a division of Prentice-Hall of Englewood Cliffs, New Jersey. Their number is (201) 592-2352.

Q: Are "do-it-yourself" projects involving expansion boards and memory chips like those discussed in your "Inside The Box" story (PERFORMANCE, April) possible with an IBM PCjr?

A: Yes, but most expansion projects for the PCjr must take place outside the box. IBM offers a plug-in 300-baud modem card (\$99) that slips into the PCir's lone expansion slot inside the unit. Beyond that, additions to the PCir are made outside the unit, by removing the side panel and plugging attachments into the computer's system bus connector. IBM offers attachments that provide a parallel printer port (\$99), 128k of memory (\$199), and the extra electrical power (\$99) needed to support several such additions. The brick-shaped attachments can be snapped together to boost your PCjr to 512k of usable memory.

Other manufacturers sell attachments for the PCjr as well. Tecmar, Inc., offers an expansion attachment for the PCjr called jrCaptain (\$395) that adds 128k, a printer port, and clock/calendar functions. You can add more memory with Tecmar's jrCadet (\$195 to \$595), which attaches to the jrCaptain to supply 64k to 384k in additional memory. If you want to add memory only, Tecmar's jrWave (\$295 to \$495) can supply up to 256k without the jrCaptain product.

Though IBM does not offer a second disk drive for the PCjr, other companies may. Quadram Corp. once offered an expansion chassis for the PCjr called Quadjr (\$675) that includes a printer port, a clock/calendar device, and a second 360k disk drive. Though Quadram says it is no longer manufacturing the product, you may still be able to find the Quadjr in some retail stores. Dealers also may carry similar disk drive products for the PCjr.

Q: I need some help to play a couple of the games in the Scott Adams Adventure Games series. Could you give me the address to send away for the "Hint Book" mentioned in the software literature?

A: Send \$9.95 to Adventure International, PO Box 3435, Longwood, FL 32750.

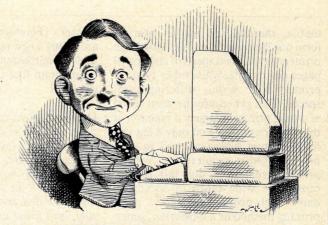
Q: I've heard that the 80286 microprocessor in the IBM PC AT and in ATcompatible personal computers like the Compaq Deskpro 286 and Tandy 3000 can access up to 16 megabytes of usable RAM memory. Does this mean that the software I use and the data files I create will have this much room to work with if I buy an 80286 machine?

A: No, at least not yet. The IBM PC AT and AT-compatible models use the Intel 80286 microprocessor as their central processor. The 80286 chip can address up to 16 megabytes (16,384k bytes) of usable memory (RAM)-but there's a catch. The 80286 microprocessor must run in a special, "protected" mode to tap that much RAM memory, but the current versions of PC-DOS and MS-DOS do not support that mode. This capability of the 80286 remains largely unexploited by popular applications software as well. For now, 80286 personal computers such as the IBM AT must operate in the chips' "real" mode, which emulates the functions of the 8088 and 8086 microprocessors of older machines, such as the IBM PC and Compaq Deskpro. This means that the 80286 computers are subject to the 640k memory ceiling of their ancestors. The one realized advantage of the 80286 is speed—AT-class computers run faster than earlier machines, yet still maintain a high degree of software compatibility with them.

Why not use the 80286's "protected" mode? Wholesale changes to MS-DOS and applications software probably will be necessary to take full advantage of the 80286 microprocessor. Such alterations are likely to result in AT-specific operating systems and applications software, causing a significant gap in compatibility between the 80286-class and

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8088-class computers. Still, the IBM AT and compatible computers presumably would be able to access up to 16 megabytes of usable memory if these changes were effected.

Switching between "real" and "protected" modes, which offers some promise of performance improvements and continued compatibility, amounts to a cumbersome and slow process, according to an Intel representative. While the speculative pros and cons of "protected" mode operation are being ironed out, 80286 computers remain very much tied to the 640k memory barrier.

It should be noted, however, that you can add multiple megabytes of memory to an 80286 personal computer right now. But extending RAM beyond 640k with normal memory expansion cards in an IBM AT or a compatible machine will not buy added space for software or data. This extra memory can be used only as a RAM disk-a section of memory designated to act as a very fast disk drive-or in some cases as a print buffer. Sophisticated "expanded" memory cards like the Intel Above Board and AST Rampage products can add usable memory to an AT-class computer-up to 8 megabytes of it. Expanded memory cards are also available for 8088 and 8086 machines.

Q: Many software packages advertise mailing list or "mail merge" capabilities. What function do such features serve?

A: The mailing list or so-called "mail merge" and "list merge" features enable you to enjoy the convenience of form letters. You write a single letter and send it to a number of people, personalizing each letter by instructing the computer to pull in (merge) information from a mailing list. The personalized information in a mailing list might include names, addresses, salutations, company names, account numbers—whatever data is needed.

Mail merge capabilities are available in many word processing programs. WordPerfect, Microsoft Word, Multi-Mate, WordStar 2000 and Volkswriter 3 all include a mail merge feature. Some word processing programs require a partner program to perform mail merge functions. WordStar 3.3 must be paired with Micropro's MailMerge program to produce form letters, and PFS:Write brings in data from sister program PFS:File to do mail merge. Some word processors that include mail merge functions can import list information

from data base programs, too. Word-Perfect, for example, can bring in data from dBase III files and convert that data into its own mailing list format. Integrated packages that include word processing and data base functions, like Framework II and Symphony, almost always have mail merge capabilities.

The process of producing form letters differs from one program to the next, but the fundamental steps are the same. In creating a form letter, you place special markers or codes in the body of the text that correspond to fields in a data base or lines in a mailing list. These markers or codes indicate where you want certain information like names and addresses to appear. Using the program's mail merge feature, you instruct the software to replace the markers or codes embedded in the text with the corresponding information from the data base or mailing list and then print the letters. A letter is produced for each data base record or information grouping in your mailing list. Of course, the data base or mailing list of information must be created before you can begin using mail merge features.

Q: In the article "The Music Connection" (LEISURE, January), there were packages mentioned that take advantage of the Mockingboard from Sweet Micro Systems of Cranston, Rhode Island: the Guitar Master by Master Soft, Music Construction Set by Electronic Arts, Music Star by Siegfried, Inc., and Music Concepts by Ventura Educational Systems. I would like the addresses of the above companies.

A: Master Soft is at PO Box 1027, Bend, OR 97709; (503) 388-7654; Electronic Arts is at 180 Gateway Drive, San Mateo, CA 94404; (415) 571-7171; and Ventura Educational Systems is at 3440 Broker Hill St., Newbury Park, CA 91320; (805) 499-1407. We weren't able to locate a current address and telephone number for Siegfried, Inc.

Q: I have an IBM Monochrome Display and plan to buy an IBM Color Display. I'd like to use the monochrome monitor for text and the color monitor for graphics. How can I get these two monitors to work with the same IBM Personal Computer?

A: Using two monitors simultaneously with an IBM PC or a compatible computer is easy, provided you have the necessary connecting equipment. Besides the monitors themselves, you'll need two plug-in display cards and two

cables. For the monochrome monitor, you'll require an IBM Monochrome Display Adaptor for text only or a Hercules Graphics Card for text and monochrome graphics. Display cards that are compatible with the MDA or Hercules standards will also work. For the color display, you'll need an IBM Color Graphics Adaptor or compatible card. If the monitor is an Enhanced Color Display, then an Enhanced Graphics Adaptor can be used for sharper color images. The cables connecting the monitors to the adaptor cards should be included with display units.

Before plugging in the display adaptors and cabling them to the monitors. check your operations manual to see if the DIP switches inside the computer need to be set first. These switches tell the computer what type of monitor(s) is connected to the system. For the IBM PC, for example, the proper switch setting for two monitors is described in the operations manual as "IBM Monochrome Display or more than one monitor." Next, check to see if there are any switches on the display cards themselves to be set. Once all the settings are made, plug the cards into the computer and connect the accompanying cables at both ends.

When first turned on or restarted, a computer with two monitors probably will begin by using the monochrome display. But you can switch between the two displays with the MODE command in MS-DOS. Use MODE CO80 (color, 80 columns across) to switch to the color display and MODE MONO to switch back to the monochrome display. Many applications programs will do the switching for you. Programs written specifically for a color graphics adaptor, or written with that adaptor as the assumed (default) display, will automatically use the color screen when loaded. Some programs use the color graphics display only when needed; you can run Lotus 1-2-3 on a monochrome display, but color graphics will appear on a color display if one is connected. Other programs enable you to select the desired monitor in a setup routine and then load accordingly thereafter. Between the MODE command and your applications software, you should be able to reap the advantages of sharp monochrome text and colorful graphics using your two monitors.

CORRECTION

In the May issue, the screen that is shown on page 101 is from the Dow Jones News data base.

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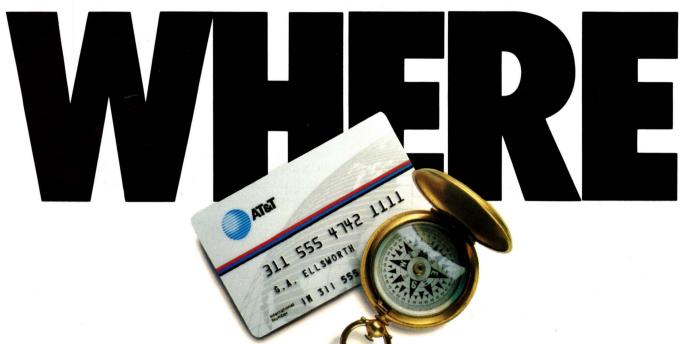
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